Chapter One: Introduction

The subject of this dissertation is the teaching and learning practices in higher education in Bhutan. The study was conducted to gain greater insights on how conceptions of teaching and learning have impacted on the practical application in the planning, implementation and evaluation phases in the classrooms of select colleges of the Royal University of Bhutan (RUB).

This chapter presents the background of the study: the problem definition, the context of the study, and the nature of the study as well as a brief outline of the dissertation.

Background to the study (Theories of conceptions of teaching and learning)

Teaching and learning are about knowing and knowledge, about being able to estimate the veracity of knowledge. It is also about the questions of how knowledge is acquired and how students should come to know. While the study of teaching and learning practices at different levels of education have been a focus of educational research for quite some time now, studies in higher education teaching and learning do not have a long research history and tradition (Kandlbinder & Peseta, 2011). This creates a challenge for researching university teaching and learning. This challenge is more so in the Bhutanese context as research at this level and in this area have not been attempted, so there is much to be explored.

Many countries have carried such studies as part of an international research agenda, resulting in a body of research about the nature and process of teaching and learning in higher education. The debates have created a minefield of overlapping concepts, and drawn on other disciplines for their conceptual frameworks (Savin-Baden, McFarland, & Savin-Baden, 2008, p. 211). While the overlapping concepts can be viewed as a strength that contributes to the understanding of the nature of teaching and learning in higher education, it can also be a challenge. Studies by reputed educational researchers (Biggs, 2003; Entwistle, 2008; Lam & Kember, 2006; Ference Marton & Säljö, 1976a; Prosser & Trigwell, 1999a; and Ramsden, 2003) have provided an overview of teaching and learning in higher education. Their findings were based on the

deep to surface teaching approaches from teacher-centred, transmission-of-knowledge conceptions to learner-centred, facilitative conceptions. The core findings indicate that there is a relationship between how lecturers teach and how students learn: when lecturers focus on traditional teacher-centred ways, students tend to adopt surface learning strategies. The relationship between how students learn and the learning outcomes, suggests that learning can be promoted when effective learning outcomes are developed that promote deep learning. Such an approach reinforces the value of a paradigm shift from a teacher-centred transmission approach to a learner-centred facilitative approach to teaching and learning. The articulation of learning outcomes also influences the way the teaching and learning strategies and assessment in the classrooms are employed by the teachers.

Understanding how lecturers think about their teaching, how they actually teach and what they see as important in terms of student learning (Samuelowicz & Bain, 1992) is crucial for staff and course development. It is equally important to understand how students learn, what they conceive learning to be and how this relates to the lecturer's perception of teaching. Although current teaching and learning studies reveal marked differences between how students approach learning and how lecturers approach teaching (e.g. Kember, 2001), little attention has been paid to understanding these differences and their implications for designing successful learning environments. The need to understand how lecturers teach most effectively and how students learn most effectively is more apparent than ever before from research done by Biggs (2003), Ramsden (2003), Entwistle, Skinner, Entwistle and Orr (2000), Trigwell and Prosser (1997). As noted earlier, in the Bhutanese context, research at this level and area has not been attempted. The present study is expected to promote further similar studies.

Rapid advances necessitate the creation of very different learning and teaching experiences for students and lecturers alike. This is particularly the case for technological advances. It is a world where college lecturers are constantly expected to improve the quality of their teaching and their students' learning outcomes (Ramsden, 2003). These pressures form the inevitable setting for any debate regarding better university teaching.

Context

The study investigates the prevalent teaching and learning practices in select colleges of the Royal University of Bhutan (RUB). Although the selected colleges had offered programmes of study since long before the establishment of the RUB, such a study had not previously been undertaken. In 2003, new policies regarding the teaching and learning practices at RUB were designed to correspond with the philosophy of the newly established RUB. After the early years, and the changes that came about in the academic regulations and structure of programmes, this research was then conducted with lecturers and students from selected colleges in the university.

My interest in this topic arose from my experience with, and passion for teaching and learning, and the policy changes that were instigated when the colleges were amalgamated to become the RUB. A few years after the formation of the RUB, the Centre for University Learning and Teaching (CULT) was established. The educational needs of colleagues from across the colleges of the RUB, keen to improve their teaching and learning approaches but unsure of how to incorporate them in their teaching without either access to the necessary information or opportunities to develop their practices, were not being met. This study is a response to the needs of academic staff at RUB, the gaps in relevant published literature and the RUB's vision for educational excellence.

As just noted, with the establishment of RUB in 2003, a new and different set of policies and procedures were established. A key document which elaborated these policies and procedures was *The Wheel of Academic Law* (Royal University of Bhutan, 2006). An effect of these new policies and procedures has been that RUB staff have been required to make a conceptual shift from their use of the input model (transmission/teacher-centred) to a learning outcomes model, with students becoming responsible for their own learning (constructivist/learner-centred). Exploration of this shifting focus from input to output model is a significant aspect of the current study. This shift has occurred at different levels of education - primary, secondary, and tertiary - over a number of years. It involves a re-conceptualisation of teaching in which the student and student outcomes take priority over the needs of the teacher to transmit

knowledge. In many cases, particularly in developing countries, this re-conceptualisation challenges existing practice and thought, making it difficult to achieve. The Bhutanese situation is by no means unique. Examples of studies into the conceptions of teaching and learning conducted in other countries such as Nepal (Watkins & Regmi, 1995); China (Ference Marton, Dall'Alba, & Tse, 1992; Ference Marton, Wen, & Wong, 2005; Pratt, 1992); Hongkong (Biggs, Kember, & Leung, 2001; Biggs & Tang, 2007; Ference Marton, Watkins, & Tang, 1995); Nigeria (Watkins & Akande, 1994); United Arab Emirates (Smith, 2006) indicate that the development of teaching methods for existing staff is not easy, and top-down policies, by themselves, have had limited success. The current study explores the extent to which, within a recently imposed policy framework, lecturers are able to balance the need to develop student understanding with the need to present relevant content.

The Wheel of Academic Law (Wheel) advocates learner-centredness and declares that RUB academics must become familiar with it and incorporate it into policies and practices as and when the opportunity arises. A study of the nature of teaching and learning practices is one such opportunity.

Added to this institutional imperative, concerns raised by the government and some commentators about the quality of education in Bhutan add to the importance and timeliness of this study. In the context of political changes in Bhutan, the Royal Government of Bhutan has expressed the goal of providing gainful employment to all Bhutanese. A focus on quality education is viewed as the primary vehicle to achieve this goal (Royal Government of Bhutan, 2006). Moreover, since the RUB became autonomous in July 2011, the University has a significant responsibility for the achievement of this goal. Therefore at this juncture, it is critical and timely to examine the nature of the teaching and learning practices in RUB, to compare them with international practices and find ways to improve them.

To establish a further understanding of the policies and practices in the RUB, Appendix 1.1 (Context of the Study) sets out an in-depth account of the general background and establishes an overview of higher education policies and practices in Bhutan and their subsequent influences in RUB. It aids in understanding the

background and justification of the study.

Justification and Significance

This research is ultimately about changing aspects of pedagogic practice, in ways that support student learning. The research findings will also provide an opportunity to explore the effects of the international experiences on teaching and learning in higher education that would serve well for the Centre for University Learning and Teaching (CULT) at the RUB. Such an experience will enhance understanding and perhaps lead to implementation of more effective practices at the RUB, and contribute to the design and implementation of effective planning, implementation and evaluation practices, specifically for higher education. It can provide, the RUB and specifically the CULT with useful information, which can determine what type of training programmes, and staff development should be offered to lecturers.

This study will be a significant endeavour in promoting awareness of the nature of planning, implementation and evaluation practices taking place in the classrooms of RUB. These findings will also be beneficial to the lecturers and students and suggest ways to implement effective teaching and learning practices in the classroom setting. By understanding the roles of effective planning, implementation and evaluation, student learning will be better supported.

This study is the first qualitative research to investigate the planning, implementation and evaluation practices in the classrooms with reference to both students and lecturers' conceptions of learning and teaching in higher education in Bhutan. It is significant in filling a gap of in-depth empirical data regarding classroom practices of the RUB lecturers. It also aims to bring to the fore the qualitative insights into the influence the culture of students and lecturers has on their perceptions of teaching and learning. Such an in-depth investigation has the potential to inform other international research studies.

To this end the broad research statement that informs this research is:

An Inquiry into the nature of teaching and learning practices at the Royal

University of Bhutan.

This statement will be interpreted in relation to the specific context of planning, implementation and evaluation demonstrated by lecturers in the colleges of the RUB, and gives rise to three specific research questions:

What is the nature of the planning that lecturers engage in as they prepare for their lessons?

How do the lecturers implement their prepared plans in a way that supports student learning?

To what extent do the planning and implementation practices of the lecturers' support student learning?

The research questions emerged from the literature on teaching and learning in higher education, taking cognisance of the broader conceptions of deep and surface learning that have influenced research at this level, to the classroom practices related to planning, implementation and evaluation of these practices.

Assumptions

This research project assumes that student-centredness, active, and deep learning is founded in western educational research and values. The manner in which these are interpreted and applied in the RUB classrooms may, however, contain some aspects of teaching which are particular to Bhutanese culture, such as focussing on a unique, respectful relationship between student and teacher which in many ways sets the learning climate in the classrooms and influences what is to follow.

It is further assumed that improved ways of planning, implementation and evaluation will naturally lead to more effective learning. The use of terms such as 'effective' and 'good' teaching and learning are used irrespective of whether the approach is learner-centred or teacher-centred, or whether active or deep learning approaches are employed, as, long as *student learning is possible* using them. It is assumed that what ultimately matters is that students learn something worthwhile.

Another assumption is that expecting students to be active participants in the

class when they have not *actually* been exposed to this learning style, or trained to be active learners in class, conflicts with the learning histories of the students. It is assumed that since they were mostly 'spoon-fed' and 'nurtured' as passive learners with a desire for more content, it is unreasonable to expect those students to readily become active participants in learning. By the time they are enrolled in tertiary colleges, some students may be open to learner-centredness, but these are in the minority.

Finally, it is assumed that a study of a small sample of lecturers' lessons can provide useful insights that will contribute to the improvement of planning, implementation, and evaluation practices in RUB.

Delimitations

I acknowledge that this research was conducted only in a few colleges of RUB and not all ten colleges and, further, that it is undertaken by one individual who also has considerable responsibility of the Centre for University Learning and Teaching (CULT) that is central to the study.

Organisation of the this dissertation

The dissertation is organised into nine chapters. Chapter 1 introduces the dissertation, and sets out the main reasons for conducting the study, as well as the significance of the research in the higher education system of Bhutan. Chapter 2 sets out the theoretical framework on which this study is based, by reviewing the literature on teaching and learning practices in higher education. Chapter 3 describes the research methods used, provides the general conceptual framework, and explains the contextual framework within which the data was analysed. It explains the research methodology and clarifies how the study was performed. It also outlines the qualitative approach of the research, and the methods used for collecting and analysing qualitative data. Chapters 4, 5, 6, and 7 provide an analysis of data that emerged in the case studies of the four Colleges in the RUB. Chapter 8 provides the main discussion of the research study through a cross case analysis based on findings from the four case studies and the pilot. Finally Chapter 9 draws on the preceding chapters to present a series of conclusions, implications, and recommendations relating to the nature of teaching and

learning in RUB. The following chapter examines Teaching and Learning in Higher Education establishing the literature base of the study.

Chapter Two: Teaching and Learning in Higher Education

Introduction

The main purpose of this chapter is to survey the literature that informs the research questions. Kember (1997) asserts that conceptions of teaching influence teaching approaches that, in turn, affect student learning approaches and consequently learning outcomes. Cornish and Garner (2009) also maintain that of all the factors that shape teachers, it is the way they think of learning and knowledge, their paradigmatic conceptions, that are most crucial.

On this basis, this chapter begins with a discussion of teaching and learning in higher education that provides the theoretical basis for the research, which is largely focussed on constructivist view of teaching and learning. Later discussion turns to the practical application of teaching and learning in planning, implementation and evaluation phases focussed more on behaviourist and cognitivist perspectives on effective practices and how these inform the research questions.

Teaching and Learning in Higher Education

Teaching and learning in higher education has been the subject of research for quite some time. Such discussions have influenced educational policy-makers, including those in Bhutan (see Appendix 1.1 for details). From such debates influential reports have emerged, including those of Entwistle and Ramsden (1983), Entwistle, Skinner, Entwistle, et al. (2000), Prosser and Trigwell (1999b), Ramsden (2003), in the UK, Barr and Tagg (1995) in the US, and Bowden and Marton (2004), Biggs (e.g.1979, 1987, 2003) in Australia. Thus recent concern in the RUB about the quality of teaching and learning practices are consistent with trends elsewhere.

It is fundamental to this discussion that, in general, 'teaching' refers to activities undertaken by teachers and 'learning' refers to activities undertaken by students. In this context 'activities' might include thoughts, knowledge, beliefs and dispositions as well as observable actions. It must be acknowledged, however, that in the process of teaching and learning, the roles of participants are often reversed: the teacher learns and the student teaches.

Teaching in Higher Education

In recent times, quality teaching in higher education (HE) has been identified with the promotion of effective learning opportunities for students (Broder & Dorfman, 1994 as cited in Ballantyne, Bain, & Packer, 1997). Laurillard (2002, p. 11) maintains that as higher education has become less elitist, and has taken on the task of educating anyone who wishes to pursue HE studies, many institutions have the aim of teaching *to make student learning possible*' (Ramsden, 1992, p. 5). This aim places greater responsibility on the teacher, and implies that they must know something about students' learning and what makes that possible. A necessary starting point is the establishment of an understanding of the conceptions of *teaching* and *learning*, followed by a consideration of the implications of the various conceptions of teaching and learning in the classroom. This approach helps in funnelling the discussions on the research questions.

What is teaching?

Until recently the prevailing view of university teaching was the ability to pass on knowledge. Consequently, the main role of the lecturer was as the possessor of that knowledge. Implicit in this role was the requirement that the lecturers should be capable of imparting the knowledge as well as knowing it.

Teaching is a complex, multifaceted activity, often requiring teachers to juggle multiple tasks and goals simultaneously and flexibly (Eberly Center for Teaching Excellence, 2011). Kapranos's description of teaching captures its essence and its complexity:

> *Teaching is an intensely human and interactive activity. There are different learning styles, a plethora of educational aims, a variety of curricula, a profusion of communication techniques, different skills to be taught and learnt, negotiations, administrational duties, philosophical aspects, professional aspects, psychological aspects, practical aspects, institutions, funding bodies, and a myriad of other factors to be considered by the teachers in their daily duties. Above all, there are the human interactions, with students, colleagues and outside agencies* (Kapranos, 2007, p. 6).

The contention whether teaching is a science or art has been debated for sometime now. Proponents of the view that teaching is a science are of the opinion that through careful selection and pacing of materials, to regulate interactions among the students, the teacher, and materials to be learned, thus reducing the possibility that learning occurs by chance (Davis, 1997, pp. 6-7). On the other hand, those who view teaching as an art argue that teaching involves great intuition, improvisation, and expressiveness and that effective teaching depends on high levels of creativity, sound judgment, and insight (Davis, 1997). Proponents of the latter argue that the scientific approach ends up as a formalised, cookbook approach that forces students to perform and makes learning too rigid or complex. They also argue that this approach can concentrate on trivialised behaviours. Eisner (1982), for example, argued that teachers make complex judgments that unfold during the course of instruction. They deal creatively with the unexpected as there are no fail-safe routines and prescriptions for success. Eisner (1982) also maintained that the most important goals of teaching are those events that arise during the process with the outcomes often embedded in the learning process itself.

However, this discussion maintains that both are required for making well-informed professional decisions about teaching, as teaching is a profession requiring judgement. It calls for the trained eye to see what is actually happening, and then to decide what to do next (Davis, 1997). In fact, the mark of a profession is that its knowledge cannot be reduced to fail-safe rules and universal prescriptions.

In summary, teaching is a highly complex activity that draws on many kinds of knowledge. It is a complex cognitive skill with affective and intuitive dimensions. Conceptions of teaching are fundamental to the way teachers perceive their teaching, and include knowledge of student learning and knowledge of subject matter.

Conceptions of Teaching

In the past twenty years research into conceptions of teaching and learning in higher education has increased considerably. However, there is a lack of a clear, agreed-

upon definition of, and terminology for conceptions especially for teaching. Terms such as *beliefs, orientations, approaches* and *intentions* have been sometimes used interchangeably (Devlin, 2006). This has been viewed as an impediment to research in this area and as noted by Kember (1997), definitions are often absent from the literature.

Additionally, Biggs (1999), and N. J. Entwistle et al. (2000) describe conceptions of teaching as idiosyncratic largely unarticulated composites of individual teachers' assumptions, knowledge, and beliefs about teaching. Furthermore, not only is there no general agreement about what conceptions of teaching might be, there is no agreement on whether it is possible for a person to hold several different conceptions of teaching simultaneously (K. Murray & MacDonald, 1997, p. 336). They argued that apart from the level of complexity varying enormously, it is evident that the authors' own conceptions of teaching have influenced their analysis. The studies report definitions of conceptions ranging from teaching as delivering, presenting or transmitting content, to teaching as facilitating or helping students to grow or learn or change their conceptions of the subject matter. Some aspects of conceptions are likely to be consistent across contexts but other aspects may be variable (Prosser, Trigwell, & Taylor, 1994). In addition, it can be expected that a conception of learning may underlie a concept of teaching, or at least be intrinsically related (Prosser et al., 1994).

Consequently many studies made the effort to distinguish between teacher knowledge and teacher beliefs (Calderhead, 1996) but such distinctions were found to be neither helpful nor possible. Instead researchers have resolved to adopt the term conception, which is understood as meanings about teaching that will guide a teacher's perception of a situation and shape actions (Lam & Kember, 2006). In this study, the term 'conceptions' will be used as 'meanings', and 'approaches' to mean 'strategies'.

In the 1980s, Marton's phenomenographical studies (1981 and 1986 as cited in Prosser et al., 1994) were used to guide the study of the ways in which teachers conceived teaching and learning. These conceptions were depicted as being relational. Prosser et al. (1994) noted that the way teachers *conceive* teaching and learning cannot be observed, so it is important to understand how teachers teach and what they believe about teaching. If this can be understood and achieved, then it will be of greater

significance to relate their understanding and beliefs to students' learning, presuming that helping teachers change their conceptions of teaching would more likely improve the quality of student learning (Prosser et al., 1994). This idea was built upon and reinforced by Ramsden (2003); Biggs (2003); and Entwistle (2000).

Similar studies were relatively rare within the higher education sector until the last decade. While some elements of school-based research were likely to be applicable to university conceptions, it is likely that there would be dimensions which were not apparent in school teachers' work, as universities operate under quite different value systems and traditions from schools (Kember, 1997). For some time now universities have been faced with the challenge of moving to an approach to teaching that is learner-centred in order to enhance student learning experiences (Budge, Clarke, & de la Harpe, 2007, p. 68). This has necessitated a shift in the way university academics view learning and teaching, and how they conceptualised their roles as teachers. Over the years substantial research literature that investigates university teaching from the perspective of teachers themselves has developed (Postareff & Lindblom-Ylänne, 2008).

Table 2.1 shows a selection of significant investigations over the last 20 years that have identified a number of different conceptions of teaching held by academics in higher education.

Table 2.1. –Conceptions of Teaching in Higher Education

Researchers	**Year**	**Research work**	**Conceptions**
Dall'Alba, G.	1991	*Foreshadowing conceptions of teaching*	*Four conceptions*: Presenting information/transmitting information, Developing capacity to be expert, Exploring ways of understanding, and Bringing about conceptual change.
Martin, E. & Balla, M.	1991	*Conceptions of teaching and implications for learning*	*Three conceptions:* Presenting information, Encouraging active learning, and Relating teaching to learning.

Researchers	Year	Research work	Conceptions
Dunkin, M.J. & Precians, R.P.	1992	*Award-winning university teachers' concepts of teaching*	*Four conceptions:* Structuring learning, Motivating learning, Encouraging activity and independence in learning, and Establishing interpersonal relations conducive to learning.
Samuelowicz, K. & Bain, J.D.	1992, 2001	*Conceptions of Teaching Held by Academic Teachers*	*Five conceptions:* Imparting information, Transmitting knowledge, Facilitating understanding, Changing student conceptions, and Supporting student learning.
Martin, E. & Ramsden, P.	1992	*An expanding awareness: how lecturers change their understanding of teaching*	*Four conceptions:* Presenting content of process, Organising content and/or procedure, Organising learning environment, and Facilitating understanding through engagement with content and process.
Gow, L. & Kember, D.	1993	*Conceptions of teaching and their relationship to student learning*	*Two conceptions*: Knowledge transmission, and Learning facilitation.
Murray, K. & MacDonald, R.	1997	*The disjunction between lecturers' conceptions of teaching and their claimed educational practice (Business School)*	*Four conceptions:* Imparting knowledge, Enthusing, encouraging, and motivating students, Facilitating student learning, and Supporting students.
Biggs, J. & Moore, P.	1993	*Process of Learning*	Identified a theoretical hierarchical order which moves from a *quantitative approach* of *transmitting* to a qualitative approach, where teachers *facilitate* an understanding of meaning, a broadening of outlook and a change in the learners.
Kember, D.	1997	*Reconceptualisation of the Research into University Academics' conceptions of Teaching*	*Two conceptions (revised):* Teacher Centred/Content-oriented category: a. Imparting information b. Transmitting structured knowledge. Student-centred/learning-oriented category: a. Facilitating understanding b. Conceptual change /intellectual development.

Researchers	Year	Research work	Conceptions
Van Driel, J.H *Verloop*, N. *Van Werven*, H. & *Dekkers, H.*	1997	*Teachers' craft knowledge and curriculum innovation in higher engineering education*	*Three conceptions:* Teacher-centred, Student –Directing, and Student-centred.
Pratt & Associates	1998	*Five Perspectives on Teaching in Adult and Higher Education*	*Five conceptions*: Transmission, Apprenticeship, Developmental, Nurturing, and Social Reform.
Prosser, M. & Trigwell, K.	1999	*Understanding learning and teaching*	*Six conceptions:* Transmitting concepts of the discipline, Transmitting the teachers' knowledge, Helping students acquire concepts of discipline, Helping students acquire teacher's knowledge, Helping students develop conceptions, and Helping students change conceptions.
Åkerlind, G.S. & Jenkins, S.	1998	*Academic views of the relative roles and responsibilities of teachers and learners in a first-year university course*	Identified the teachers' perceptions of student learning and of the relative responsibilities of teachers and learners.
Kember, D. & Kwan, P. K.	2000	*Lecturers' approaches to teaching and their relationship to conceptions of good teaching*	*Two conceptions:* Teaching as transmission of knowledge, and Teaching as the facilitation of learning.
Martin, E., Prosser, M., Trigwell, K., Ramsden, P., & Benjamin, J.	2000	*What university teachers teach and how they teach it*	*Three conceptions* Information transmission Conceptual Development Conceptual change
Åkerlind, G.S.	2004	*A new dimension to understanding university teaching*	*Four conceptions:* A teacher transmission focused experience; A teacher–student relations focused experience; A student engagement focused experience; A student learning focused experience.

Researchers	Year	Research work	Conceptions
Prosser, M., Martin, E., Trigwell, K., Ramsden, P., & Lueckenhausen, G.	2005	*Academics' experiences of understanding of their subject matter and the relationship of this to their experiences of teaching and learning*	*Two conceptions* Information transmission and teacher-focused ways; Conceptual change and student-focused ways
Postareff, L., Katajavuori, N., Lindblom-Ylänne, S. & Trigwell, K.	2008	*Consonance and dissonance in descriptions of teaching of university teachers*	*Four conceptions:* Consonant and learning-focused Consonant and content-focused Dissonant Consonant learning-focused

While some researchers have identified two or three or even six conceptions, from these investigations two broad orientations of conceptions of teaching emerge. One is a teacher-centred conception, concerned essentially with organisation of the content of the teacher's knowledge for transmission to students (e.g.Dall'Alba, 1991; E. Martin & Balla, 1991; Samuelowicz & Bain, 1992 , 2001); and the other is a student-centred conception, concerned with facilitating learning (e.g. E. Martin & Balla, 1991; Gow & Kember, 1993; Murray & MacDonald, 1997; Van Driel, Verloop, & Dekkers, 1997; Proser & Trigwell, 1999; Åkerlind & Jenkins, 1998, Kember & Kwan, 2000). The study of conceptions have also emerged from the lecturers' experience of understanding of subject matter and the relationship of this understanding to the experience of their teaching (e.g. (E. Martin, Prosser, Trigwell, Ramsden, & Benjamin, 2000; Prosser, Martin, Trigwell, Ramsden, & Luechenhausen, 2005).

However, this dual – teacher-centred and learner-centred conceptualisation has been contested. Kember's (1997) five conceptual categories depict the first two categories (imparting information, and transmitting structured knowledge) as representing a teacher-centred orientation to teaching, and the last two categories, as representing a student-centred orientation (facilitating understanding, and conceptual change/intellectual development). The middle category (student-teacher interaction/apprenticeship) represents an intermediate category that falls somewhere between the two. Samuelowicz and Bain (2001) however, challenged the idea of an intermediate conceptual category, suggesting that all conceptions of teaching are

primarily teacher-centred or student-centred. In a review of their 1997 study, Kember and Kwan (2000) suggested a two-level synthesis of the category descriptors under two broad conceptions of teacher-centred/content-oriented and student-centred/learning-oriented. Both of these conceptions have two sub-categories in the earlier conceptions, labelled 'imparting information' and 'transmitting structured knowledge' for the former and 'facilitating understanding and conceptual change/intellectual development' for the latter. This established that the conceptions of teaching were largely oriented towards either the transmission or facilitation models, alluding to teacher and student-centredness respectively.

Approaches to teaching have been shown to vary from one teaching context to another (Lindblom-Ylänne, Trigwell, Nevgi, & Ashwin, 2006; Prosser et al., 2005; Prosser & Trigwell, 1999a; Samuelowicz & Bain, 1992). Studies by Prosser and Trigwell (1999a), (Kember & Kwan, 2000) and Åkerlind (2004) have found that learning-focused strategies and content-focused strategies can co-exist, while learning-focused conceptions and content-focused conceptions are much less compatible. A teacher-centred conception was consistently found across the range of investigations as constituting a less sophisticated view of teaching than a learner-centred conception, and is regarded as less likely to produce high quality learning outcomes amongst students (Åkerlind, 2004).

The studies into conceptions of teaching in higher education resulted in mixed findings. Firstly, it was difficult to make direct comparisons as a number of methodologies were used (K. Murray & MacDonald, 1997). Evidence from recent research has established what appears as nested hierarchy of conceptions of teaching moving from teacher-focused to student focused categories (Entwistle & Walker, 2000).

(S. F. Young, 2008) asserts that whether tacit or explicit, conceptions are amassed through personal experiences of teaching and learning and assimilated through interactions with changing contexts. Changes in conceptions also occur as a result of reflection on the effects of continued teaching experiences as opposed to simply being exposed to alternative conceptions held by other teachers (Åkerlind, 2004; Entwistle & Walker, 2000). In these ways, conceptions of teaching and learning can be understood

to be in on-going stages of development.

Pajares (1992) suggested that the conceptions of teachers come predominantly from their experiences as students. There is also evidence that teacher conceptions differ from society to society, with teachers' conceptions tending to be consistent with the policy and cultural priorities of any jurisdiction (G. T. L. Brown & Harris, 2009; G. T. L. Brown, Lake, & Matters, 2009; G. T. L. Brown & Remesal, 2012). Therefore the influences of culture on conceptions of teaching of the RUB academics have to be considered. For instance, using English as the medium of instruction in Bhutan could hinder academic communication, as teachers may not be able to articulate as expressively while teaching in English as they would in their own language. Further, socio-cultural factors discussed in Appendix 1.1 (Context of Study) include the impact of these factors on the way lecturers think and therefore teach.

Table 2.2 sums up the findings of the relevant literature. Teachers who conceive of teaching as transmitting information to students approach their teaching in terms of teacher-focused strategies. On the other hand, teachers who conceive of teaching in terms of helping students to learn, teach using student-focused strategies (Kember & Kwan, 2000; Trigwell & Prosser, 1996). Learning, according to Biggs (1999), is primarily the result of appropriate teaching.

Table 2. 2. Summary of conceptions of teaching

Conceptions	**Approaches**	**Roles**
Teacher -centred	Content-focused Strategies	Transmitter of information
Learner-centred	Learning-focused strategies	Facilitator of learning

Learning in Higher Education

In today's knowledge and information-led society, learning has a central role. Consequently there is an increasing orientation towards education and life-long learning

which are crucial for the formation of policy and practice and the individual experience of learning (Illeris, 2009).

Learning in university is different from learning in schools, because approaches to learning and assessment procedures and expectations are different (Dublin City University, 2011). Additionally, each subject area has its own specialist discourse and particular way of constructing knowledge. Students come into higher education with differing conceptions of learning. Depending on their previous educational experiences, students may see learning principally as a matter of acquiring information and reproducing it accurately. Alternatively they may believe that learning depends on analysing, applying and evaluating information to reach personal understanding.

The following sections include discussion of definitions of learning, associated conceptions, and influences upon learning.

What is Learning?

(Churchill et al., 2011) asserted that since there are many facets to learning, clearly defining it is an arduous task. It is a concept that encompasses a wide range of processes, which can be achieved by individuals in an equally wide range of ways (Cornish & Garner, 2009, p. 31). Bowden and Marton (2004, p. 23) metaphorically describe learning as exploring paths in the landscape of knowledge that have been publicly charted by others. The knowledge acquired is new for the individual.

According to Shuell (1993) learning is considered to be an active, constructive, cumulative, self-regulated, and goal-oriented process in which the learner plays a critical role. Learning is active in that the learner must employ cognitive processes such as analysing, applying, synthesising and evaluating the newly presented information. The way in which the learner processes information and develops his/her own understanding determines the quality of learning. Shuell (1987) pointed out that 'what and how much an individual learns depends on the activities in which he or she engages; learning involves more than passively responding to the environment.'

During recent decades, the concept of learning has been reformulated in response to new insights developed within related disciplines such as cognitive

psychology, learning sciences and instructional psychology (Segers, Dochy, & Cascallar, 2003, p. 2). They explain that at the higher education level when students construct their own knowledge base, effective or meaningful learning is conceived. In doing so learners need to develop strategic learning behaviour, they must master effective strategies for their own learning. While learning has traditionally been understood to mean the acquisition of knowledge and skills, today the concept covers a much larger field that includes emotional, social and societal dimensions (Illeris, 2009, p. 2).

However, none of these perspectives can offer a complete explanation of learning, as learning means different things to different people, thus conceptions of learning reflect peoples' views of learning. The approach adopted may vary from situation to situation, so will the view of learning. According to G. Brown (2004) learning will depend as much on the orientation of the definer as on the nature of learning; he succinctly identifies the types of learning and associated theories:

> *For a strongly committed behaviourist, learning is the modification of behaviour brought about by experience. For most cognitive psychologists, learning is the study of how information is sensed, stored, elaborated, and retrieved. Others would stress the importance of meta-cognition (learning to learn), or reflection on experience as well as experience per se. Humanistic psychologists are more likely to insist that personal growth and development are at the heart of learning, while constructivists argue that learning is primarily concerned with how people develop different conceptions and constructions of reality* (p. 6).

In addition to the theoretical perspectives that have developed over the past century or so, newer insights that relate learning to understanding how the brain actually works have been developed. These provide useful information about what might enhance, and what might hinder learning, and therefore provide vital information about understanding both learning and teaching (Churchill et al., 2011).

In the next section, these differing conceptions of learning are discussed.

Conceptions of Learning

There is a substantial body of research that has investigated the way students in higher education conceive of learning (Ference Marton, 1988; Trigwell & Prosser, 1991,1994; Prosser & Millar, 1989; Van Rossum & Schenk, 1984). The idea of 'conception of learning' grew out of the original research by Ference Marton and Säljö (1976a) in the 1970s into approaches to learning. In this research, it was referred to as the general perceptions or preconceived ideas of learning that students bring to the learning context from past experiences. Conceptions of learning describe students' (and teachers') broad experience, or understanding of what learning consists of (Calkins, Cox, & Light, 2009). Conceptions differ in their approach to learning which is what students actually do or experience in their learning.

The first broad conceptions associated with student learning in higher education were introduced by W. J. Perry (1970) who was the first to suggest that students' conceptions of knowledge develop progressively through their educational experiences. Perry's study also concluded that learning is difficult for some students because their conceptions of knowledge were different from those of their teachers (Purdie, Hattie, & Douglas, 1996, p. 88). This stimulated the interest of educational researchers and over the decades a considerable body of research was generated about the ways that students go about their learning (Biggs, 2003).

Considerable time and attention has been spent understanding and theorising aspects of learning in higher education (Richardson, 2005). Learning is such a complex and intractable process that its study has been both difficult and contentious (Hay, 2007). Learning as increasing knowledge, or as reproduction, is associated with surface learning; while learning as understanding and developing insight is associated with deep learning according to, for example, (Blake & Smith, 2007).

Deep and Surface Learning

The original research by Marton and Säljö (1976a) gave rise to the notions of deep and surface learning. This is an empirically-based approach that aims to identify qualitatively the different ways in which individuals experience, conceptualise,

perceive, and understand various kinds of phenomena (Ference Marton, 1988). It has had a strong influence on thinking about student learning (Entwistle & Peterson, 2004). The two concepts have subsequently gained much credibility and currency in higher education (Fry, Ketteridge, & Marshall, 2008).

Essentially, the research identified two opposing conceptions of learning: reproductive or quantitative, and comprehensive or qualitative (Ference Marton & Säljö, 1976a, 1976b) through investigating the interaction between a student and a set of learning tasks. The quantitative or reproduction conception leads to memorising and acquisition of conceptions resulting in a 'surface' approach. In the comprehensive or qualitative conception, understanding reality and developing as a person results from a 'deep' approach. The research led to the conclusion that students' approaches to the task (their intention) determined the extent to which they engaged with their subject and this affected the quality of outcomes (Fry et al., 2008): surface approaches led to poor outcomes, and deep approaches to better ones. According to Entwistle and Ramsden (1983, p. 17), deep and surface conceptions of learning 'appear to be a powerful form of categorisation for differences in learning strategies'. Identifying contrasting conceptions of deep and surface learning with their respective emphases on constructing meaning and memorising details (Ference Marton & Säljö, 1976a, 1976b) is now considered to be a benchmark in understanding how students learn.

Entwistle and Ramsden (1983) and Biggs (1987) added a third 'strategic' or 'achieving' conception. This is motivated by the desire to achieve high grades and is characterised by good time management and well-organised study methods. Strategic or achieving learning seem on the whole to be seen as the ability to switch between deep/surface approaches, rather than as a distinct approach (Haggis, 2003; Volet & Chalmers, 1992).

In essence, the conception of a deep approach to learning is typified by an intention to understand and seek meaning, leading students to attempt to relate concepts to existing understanding and to each other, to distinguish between new ideas and existing knowledge, and to critically evaluate and determine key themes and concepts (Fry et al., 2008). Such an approach results from the students' intention to gain

maximum meaning from studying which they achieve through high levels of cognitive processing throughout learning. It is important to note there is some evidence that a student-focused conception of teaching will encourage students to engage in deep learning processes (Prosser & Trigwell, 1999a).

The conception of a surface approach to learning is characterised by an intention to complete the task, memorise information, make no distinction between ideas and existing knowledge, and treat the task as externally imposed. Rote learning is the typical surface approach, in which facts are learnt without a meaningful framework. The level of cognitive processing is also superficial (Fry et al., 2008, p. 11).

The conceptions of deep and surface approaches to learning have increased in sophistication with further research, most notably through the works of Biggs (1987) and Ramsden (1988). They raised questions about practices that had long been accepted in HE. Rather than drawing on the work of philosophers or cognitive psychologists, they looked to students themselves for a distinctive perspective (Fry et al., 2008, p. 11). Ramsden (1992, p. 61) asserted that 'good teaching implies engaging students in ways that are appropriate to the deployment of deep approaches'. Similarly Biggs (1999) suggested that to change a student's approach to study, it is necessary to induce an appreciation of higher conceptions of learning through the teaching environment. Good teaching should minimise those factors that lead to surface learning, and maximise those factors that prompt students to adopt approaches that achieve deep learning (Tait, 2009).

Entwistle and Peterson (2004) noted the difficulties of encouraging the development of deep approaches to learning in specific learning situations. Example of this can be with students who hold a general conception of learning in which reproduction of ideas is done through memorisation and rote learning. These conceptions may also be seen as constituting a developmental continuum. Students may enter higher education with initial conceptions that include mere reproduction of ideas but are expected to leave with more developed 'transforming' conceptions (Calkins et al., 2009).

The distinction between deep approaches and surface approaches to learning is

particularly useful for teachers who want to understand their students' learning, and create learning environments that encourage students to achieve desired learning outcomes (Biggs, 2003, p. 13). Encouraging deep learning promotes higher order cognitive thinking skills as it is the critical analysis of new ideas and linking them to already known concepts and principles (Ross & Bell, 2007, p. 1). In contrast surface learning is the tacit acceptance of information and memorisation of isolated and unlinked facts.

Most of the research into conceptions of learning has been concentrated in western countries initially associated with Marton and his colleagues in Sweden, and extended to Australia (Prosser et al., 1994), the Netherlands and Finland (Eklund-Myrskog, 1998), the United Kingdom (Ference Marton, Dall'Alba, & Beaty, 1993), and USA (Samuelowicz & Bain, 1992). There has been an increasing orientation towards workplace (experiential) and socio-cultural conceptions of learning. The interest in examining the importance of context to students' conceptions of learning has over the years led to parallel studies with groups of university students from linguistic or minority cultural backgrounds.

Studies have been also been conducted with different cultural groups in a number of different geographical areas in Asia, Africa, South America and Oceania as listed below:

1. China (Ference Marton et al., 1992; Ference Marton et al., 2005; Pratt, 1992),
2. Hong Kong (Biggs & Tang, 2007; Kember, Biggs, & Leung, 2004; Ference Marton et al., 1995),
3. Nepal (Watkins & Regmi, 1995), Nigeria (Watkins & Akande, 1994),
4. Uruguay (Nagle & Marton, 1993),
5. South Pacific (Mugler & Landbeck, 1997, 2000), and
6. Australian Aboriginal people (Boulton-Lewis, Marton, Lewis, & Wilss, 2000, 2004; Boulton-Lewis, Wilss, & Lewis, 2001; Bowden & Marton, 1998).

Although the main aims of these studies were the same as those of their western counterparts, some were of a slightly different character, with questionnaires often used

as the method of collecting data, and conditions which differed from those in Western countries (Eklund-Myrskog, 1998, p. 300). The results indicated that conceptions of learning are associated with cultural and experiential factors (Boulton-Lewis et al., 2004). It has been noted that sources such as ethnicity, family, community, and culture influence conceptions of learning (Burnett, Pillay, & Dart, 2003; Dart et al., 2000; Mugler & Landbeck, 1997; Volet, Renshaw, & Tietzel, 1994).

Current research into student learning also reveals that large numbers of students are not taking a deep approach to learning (Haggis, 2003, p. 377). Kember (2000) also suggests that approaches to learning might be better characterised as a continuum rather than as dichotomous deep and surface approaches. As a consequence of the research findings on student learning, identification of several learning approaches, rather than just two, gives richer insights into students' learning processes (Beattie, Collins, & McInnes, 1997, p. 1).

Despite the criticisms of the deep-surface learning approaches (see next section), the concepts continue to be popular and a much researched area in higher education. Entwistle (1997) argued that the reason for the popularity of the deep/surface metaphor is that it describes a 'recognisable reality', while critics such as Webb (1997) argue that it is more to do with the attractiveness of a theory which supports the deepest prejudices and common sense opinions of the education development community (1997). Case and Gunstone (2003, as cited in Malebo, 2010, p. 2) note that over the last two decades, the notion of approaches to learning has become a highly influential framework for thinking about student learning in higher education, particularly in providing lecturers and educational developers with a theory about why some students are more successful than others. These concepts, having been developed in the 1970s and 1980s, are now well established in the higher education literature (Beattie, Collins, and Mcinnes 1997, p. 1). Fry, Ketteridge and Marshall (2009, p. 135) observe that there is a growing body of research, which shows that students tend to adopt a deep approach to learning when their lecturers adopt a more student-focused approach. Ramsden (2004) asserts that the purpose of higher education is to encourage 'deep' learning, through which it is anticipated that students will change the way they view the world.

Criticisms of Deep and Surface learning

While deep and surface learning is a simple and appealing idea, it is also frequently misunderstood. Like any established set of research concepts, it has also been the object of robust criticism.

Most recently, studies have raised questions about aspects of the deep/surface dichotomy. Hall, Ramsay, and Raven (2004) and Ballantine, Duff, and Larres (2008) found that lower-level strategies, such as rote learning and paraphrasing, could be used simultaneously with a deep approach. The body of research in Asian and other cultures also shows this (e.g. Biggs, 2003; Kember, Wong, & Leung, 1999). The so-called 'dichotomy' can easily be criticised as being ethnocentric. It is only recently in the last ten to fifteen years that a range of different perspectives such as socio-cultural and value positions have begun to emerge in higher education (Haggis, 2009).

It is not the case that surface conceptions are unproductive while deep conceptions are effective; rather the hierarchy is inclusive – surface conceptions are good but insufficient and deep conceptions are good but insufficient (G. T. L. Brown et al., 2009, p. 3). The deep approach may be re-evaluated in the new learning environments. It is possible that in the future finer distinctions among different kinds of deep approaches will be developed (Entwistle & Entwistle, 2003).

Beattie et al. (1997) claimed that the distinction between deep and surface learning is complex. This is because the terms deep and surface are often thought to describe the student. They refer not to the students but to the different approaches they adopt. At different times the same students can, and do adopt different approaches, although they may have a natural or learned orientation or affinity to one or the other.

Duarte (2007) pointed out that recent perspective on approaches to learning stress the need to incorporate new key variables in the description of students' learning. For example, in an analysis of the inventories developed to measure approaches to learning, Entwistle and McCune (2004) allude to a lack of emphasis on emotion in learning, that is, there is a failure to examine emotionally-toned experiences which

accompany learning. They also hypothesise a new dimension of learning, related to vocational orientation and concrete processing, which may differentiate between practical and theoretical learning.

Finally it is unrealistic to assume that a deep approach to learning is universally desirable, since it may be necessary, given the nature of the knowledge to be acquired, to adopt a surface approach (Beattie et al., 1997). A deep-surface approach to learning has also been shown to comprise only one of several components, which influence a student's overall approach to learning.

In summary it can be said that students take different approaches to learning - deep, strategic or surface approaches. Teaching which involves students in active and independent learning is more likely to encourage a deep approach to learning. On the other hand approaches that enforces passivity in students rather than active involvement, can make students take a surface approach. Effective teaching supports student learning which in turn needs to be supported by appropriate course design, teaching methods, and assessment with a view to fostering a deep approach to learning. It is on this premise that the research questions in this study seek to find.

Cultural Influences on learning

The results of investigations into the impact of culture on students' learning are mixed. The assumption is that different cultures have different norms, values and expectations, and these cultural differences have a strong influence on conceptions of learning.

According to Pratt (1992) learning styles of students may vary from culture to culture and recent interdisciplinary research (De Vita 2001, Rambuuruth, 2001; Paul & Arcodia, 2002 and Morse, 2003 as cited in Manikutty, Anuradha, & Hansen, 2007), also emphasise the importance of understanding how learning approaches vary across cultures. Examples of how cultural dimensions affect students' approaches to learning are cited in a research report by Manikutty et al. (2007, pp. 70-78) as illustrations of how culture can affect approaches to learning. Two cultural dimensions *collectivism* and *power distance* are identified by Hofstede (1986, as cited in Manikutty et al., 2007) as

playing important roles in determining teacher/student relationships.

Collectivism: Students from cultures based on *collectivism* such as those found in Asia and Africa tend to think intuitively of themselves as part of a group placing high value on group norms and harmony (Manikutty et al., 2007, p. 73). In collective societies knowledge is seen as a commodity to be transferred from a teacher to a student, where the individual understanding of the students is not considered important (Auyeung & Sands, 1996 as cited in Manikutty et al., 2007, p. 80). This appears to support the notion that Asian and African cultures engage in surface learning rather than deep-surface learning.

Power distance: This cultural dimension applies to the power-distance relationship between teachers and students in the learning context. Teachers in such societies are ranked higher than the students in terms of the knowledge and authority vested in them. Their 'wisdom' and teachings are taken as highly authentic and are not questioned (Hofstede, 1986 and 2002 as cited in Manikutty et al., 2007). Thus, class discussions would tend to be more in the nature of clarifications than active debating about what the teacher has taught. In Bhutan, the word used for teachers */Slob-dpon/* ('*Slob*' translates as learning and '*dpon*' as master implying 'Master of Learning') which exemplifies the importance accorded to teachers in the Bhutanese culture. Consistent with cultural and traditional values Bhutanese people identify with 'tha damtshig', which is a sense of moral identity in which teachers are accorded a high degree of respect. In such cultural situations, students are conditioned to accept what the teacher says, rather than think for themselves (Hofstede, 1986 as cited in Manikutty et al., 2007) Such situations are didactic in nature and unlikely to lead to deep learning which requires extensive original effort and change of attitude.

However, with the rapid changes worldwide, many students in non-Anglo-Celtic cultures experience global cultures from the time they are born, and such concentrated 'cultural influences' involving the predominance of surface learning processes may be less powerful. Students' conceptions of learning are also influenced by other factors such as the widespread impact of information technology.

A considerable body of research into conceptions of learning held by students from non Anglo-Celtic cultures especially Southeast Asian reveals the stereotyped views The students have been stereotyped as learners who: wish largely to rote learn information; lack skills for analysis and critical thinking; and do not adjust their learning to reflect the new context (Ballard, 1987; Chalmers & Volet, 1997; Kember, 2000; Samuelowicz, 1987). This is because students from Asian countries are brought up in a restrictive teaching/learning environment, which commits them to a passive, uncritical, and reproductive mode of learning, and Western teachers of international students are advised accordingly (e.g. Ballard and Clanchy, 1997 as cited in Biggs, 1998, p. 724).

Biggs (1990) and Kember and Gow (1991), have questioned some of the generalisations and stereotypical descriptions, particularly those relating to the surface and rote learning practices of cross-cultural students from Asian backgrounds. Studies on student learning in such cultures (Kember et al., 1989; Ramsay, 2011) have found no support for the notion of students from Asian backgrounds adopting essentially surface or rote approaches to learning. Although memorisation is usually associated with poor academic outcomes in Western cultures (Watkins & Hattie, 1981 as cited in Kandlbinder & Peseta, 2011, p. 137), it is now accepted that it is not a characteristic of surface learning (Kandlbinder & Peseta, 2011) as studies has shown that there are cultural differences related to how memorisation occurs and its effects. Watkins and Biggs (1996, as cited in Kandlbinder & Peseta, 2011) maintain that the success of Asian students is due to repetitive learning strategies, hard work, an achievement motivation, and a collaborative learning environment. Seeing that memorisation is an essential part of developing understanding in Eastern cultures, Kember (1996) describes this as adopting surface strategies with deep purposes.

On the other hand, Dahlin and Regmi (1997) argue that the conceptions found in the West and Nepal are not identical but also not completely different. A common feature they identified was the prevalence of rote learning without understanding was prevalent in both cultures done with the intention to pass exams. This feature may be a result of common characteristics of the conditions of study in the East and West, but

learning within the educational system leading to an increased self-appreciation was found to be a universal factor that motivates learners across the world (Dahlin & Regmi, 1997).

Merriam (2007, as cited in Paulus, 2008, p. 4) notes that while Western notions of learning focus on a movement toward becoming more independent and productive, non-Western perspectives view the process as becoming "more fully human." While knowledge gained by means of the scientific method is privileged in Western cultures, sacred or "revealed" knowledge is highly valued in other perspectives. Rather than separating the mind from the body as Western perspectives tend to do, other perspectives involve mind, body, spirit, and emotions in their views of learning. Such views are reflected in Bhutan too and influence the way Bhutanese approach learning.

Investigations into students' conceptions of learning have shown that a student can adopt different approaches to learning in different circumstances (Kandlbinder & Peseta, 2011). Thus aspects of the learning environment such as the subject topics, aims, learning outcomes, learning strategies and assessment procedures influence the student's approach to learning. Consequently, the stereotypical views about international students, in particular Asian students, are either incorrect or not as simple as portrayed. While culture does play a role in the way that students approach their learning, globalisation and the ease with which international communication can occur via the Internet may negate those effects in the near future.

In summary the literature about conceptions of teaching and learning in higher education has developed rapidly in the last decade and can facilitate significant and useful understandings into how lecturers conceptualise teaching, and how students conceptualise learning. The sheer volume and range of studies that have been conducted to date creates a confusing display of information, making it difficult to manage and interpret.

The preceding sections on the conceptions of teaching and learning have been the basis in establishing the groundwork for the application of teaching and learning in higher education. Having explored issues relating to teaching and learning in higher

education the remainder of this chapter shall discuss the practical components of the study, which is the analytical framework, developed for examining the planning, implementation, and assessment practices which address the research questions.

Applications of teaching and learning in higher education

In the following sections the application of conceptions of teaching and learning evident in the practical components of planning, implementation, and evaluation phases in the study is discussed. The latter forms the analytical framework, which will be used to answer the research questions of the study by examining the practices of the lecturers in the case studies.

This study looks closely at the three key phases of the teaching-learning Cycle i.e. Planning, Teaching (Implementation) and Evaluation discussion of which follows, and in which the analytical framework is outlined.

Planning

Lesson planning can be defined as a systematic development of instructional requirements, arrangements, conditions, and materials and activities, as well as testing and evaluation of teaching and learning. It involves an analysis of learning needs and the development of a delivery structure to meet those needs. Schon (1983 as cited in Panasuk & Todd, 2005, p. 215) described lesson planning as pre-active decision-making that takes place before instruction. The planning of lessons involves teachers' purposeful efforts towards the development a coherent system of activities that facilitate the development of students' cognitive structures and processes (Panasuk & Todd, 2005). The quality of those decisions and efforts depends on the creativity of teachers and on their ability to apply learning and instructional theories.

Lederman and Niess (2000, p. 58) maintain that defining planning is deceptively easy as there are definitions which view lesson planning from two extreme points as described by Clark and Yinger (1995, p. 85):

> <u>*Definition One*</u>
>
> *Planning is a set of basic psychological processes in which the teacher visualises the future, inventories means and ends, and constructs a framework to guide his or her future actions.*

Definition Two

The things that teachers do when they say that they are planning.

The ideas encapsulated in the first definition guided much of the early research into educational planning during the 1960s and drew heavily on cognitive psychology to present planning as a conceptual framework. Whereas the latter is contemporary view, a practical activity employed by qualitative researchers, and more widely used because of its descriptive approach to planning (Lederman & Niess, 2000; Warren, 2000). Regardless of the different perspectives, planning remains an important concern to those engaged in teaching. Kauchak and Eggen (2010) draw a clear association between good lesson planning and good teaching.

It has been established that planning the material is much more difficult than delivering the lesson as it involves decision-making (Calderhead, 1984, 1996). Decisions are to be made concerning the subject matter to be covered, sequencing, the materials to be used, the pupils who are to be included in each activity, how the class is to be organised and what the teacher will expect from the pupils in terms of both behaviour and achievement during the course of each activity. Decisions such as these occupy a lot of the teachers' thoughts during the planning they do at various times of the day even when they are not interacting with their pupils (Calderhead, 1984).

It is during the planning of a lesson that a teacher confronts many pedagogical issues and makes choices directed towards assisting students to acquire knowledge, apply new information to practical activities and construct beliefs (Panasuk & Sullivan, 1998). Hence, it can be safely concluded that good lesson planning continuously improves the entire educational process, as it is a complex dynamic system, which regulates and correlates through analysis and interconnectivity (Panasuk & Sullivan, 1998). Thus good planning will result in good teaching and therefore meaningful learning.

Cornish and Garner (2009, p. 93) assert that 'behind every good teacher is a good planner' and it is often true that many more hours go into planning than into the subsequent teaching and learning experiences. Lederman and Niess (2000) substantiate

the notion that teachers who plan are more effective than teachers who do not plan. They question whether a written plan increases the teacher's effectiveness over a plan committed to memory is debatable. Maxwell and Kennelly (2011) claim that in a situation as complex as teaching, much of the intricate detail of what is implemented is carried around in the teacher's head. This is especially so in the case of experienced teachers who think on their feet, and react to whatever context they find themselves in (Maxwell & Kennelly, 2011). According to McCutcheon (1980), in most cases, *experienced* teachers plan their lessons mentally. They assert that this is the richest form of planning in which teachers engage in the mental dialogues before writing plans or before the lesson. (Calderhead, 1984) reported that planning, which experienced teachers are proficient at, is routine. So, while written plans are important, it is the teacher's mental plans or images that are also important in providing a picture of what is intended and should take place in the classroom.

Planning lessons is thus a fundamental skill all teachers must develop and hone. However, implementation of this skill in the actual teaching process can, and usually does, take some time (Kizlik, 2012). Being able to develop an effective lesson plan format is a core skill for all who teach effectively. In their research, Lovat and Smith (2003) found that teachers make lesson plans to obtain a sense of purpose and direction, confidence and security, and feelings of increased control. Good planning, then, is crucial to good teaching.

The importance of planning

A lesson plan is usually a written guide, a teacher's detailed description of the course of instruction for an individual lesson (O'Bannon, 2008). In the instructional process, the lesson is the primary organising structure because it involves the most important thinking processes in which teachers engage prior to the lesson itself (Calderhead, 1984; Doyle, 1977; Kounin, 1970; Robert J Yinger, 1979).

> *It is in planning that teachers translate syllabus guidelines, institutional expectations, and their own beliefs and ideologies of education into guides for action in the classroom. It helps teachers to organise their learning outcomes and methodologies in an easy-to-read format* (Calderhead, 1984, p. 69).

The lesson plan can be as simple as a mental checklist or as complex as a detailed text that is individual or follows a prescribed format (Jensen, 2001). It is described as an extremely useful tool that can serve as a guide and as a resource that underpins teaching, and which helps teachers to note the methods of delivery and the time-line associated with the delivery of the lesson content (Jensen, 2001). Lesson plans provide the structure and purpose for what teachers and pupils do in the classroom. They reflect 'the teacher's ability to present material at the required level(s), usually include an analysis of learning outcomes and an assessment of the pedagogical implications' (Panasuk & Sullivan, 1998, p. 330).

According to Calderhead (1984), a well-developed lesson plan reflects the interests and needs of students and meets best practice in education suggesting a more student-centred approach to planning. The lesson plan correlates with the teacher's philosophy of education, which is what the teacher believes is the purpose of educating the students. In order for teachers to be effective in the classroom, they must decide how to present the curriculum to the students in the most efficient and effective manner.

According to Clark and Dunn (1991 as cited in by Panasuk & Todd, 2005, p. 215) lesson planning is a psychological process of envisioning the future, and considering goals and ways of achieving them. They further assert that consciously and unconsciously, teachers make decisions that affect their own behaviour and the behaviour of their students.

However, researchers have not determined whether particular types of planning formats are more effective than others (which may explain the diversity of forms used by different education systems). There is general agreement, however, that planning is an activity in which teachers should engage (Kizlik, 2012). The core components such as learning outcomes, using effective methods to maintain learner attention and an orderly transition between activities in positive teaching and learning environments are fundamental to planning (Shavelson & Stern, 1981). In addition, providing for instructional diversity in classrooms in order to achieve goals along with effective sequencing of those goals are important steps in the planning process.

Types and levels of planning

Two types of plans, influenced by the way learning is viewed, have been reported in the literature. In the teacher-centred plans the focus is on what the teacher does and student activities – when provided – are prescribed and coordinated by the teacher usually as a supplement to the planned delivery of content. Teacher-centred lesson planning relies heavily on behavioural and cognitive learning models and focuses on the material or content to be taught (Postareff & Lindblom-Ylänne, 2008). This type of planning is greatly influenced by behavioural and cognitive learning models, especially those espoused by Gagne (Kauchak & Eggen, 2010) regardless of variations in developmental levels of the students. The students' interests are considered only after the content requirement is established.

On the other hand, planning for learning focuses mainly on what the students do. This is student-centred planning designed to achieve learning goals (Kember & Kwan, 2000) It relies heavily on constructivist learning and focuses on the student and appropriate learning (Postareff & Lindblom-Ylänne, 2008).

Planning for learning requires thoughtful, purposeful consideration at many levels, such as the five identified by Robert J Yinger (1980), namely yearly planning, term planning, unit planning, weekly planning, and daily (lesson) planning. Planning at these different levels will help maintain alignment between teaching and evaluation and facilitate ongoing student learning. It addresses several significant issues such as the logical and chronological sequence of content, organisation of topics and/or subjects, and resourcing in terms of time, space, materials, staff, and administrative support. Each level of planning has its own purpose and if carried out sequentially and systematically, effective planning will promote effective teaching.

Influence of curriculum design on lesson planning

Curriculum includes knowledge, skills and understanding that students are expected to learn for a particular learning area at a particular year level. They are packaged as programme/course documents containing modules/units. Planning the delivery of the curriculum takes place at all levels. Yinger (1980) identified five basic levels of planning: yearly, term, unit, weekly and daily planning for teaching.

Differentiation between the five levels was made using four dimensions: goals of planning, sources of information form of plans, and criteria for judging effectiveness of planning. Criteria for planning at module level thus differ from lesson planning. While module plans guide the lesson plans, they are planning at a broader level. The curriculum therefore identifies what teachers are expected to teach and students are expected to learn from the broader level guided to the lesson level. The role and influence of the curriculum design on lesson planning is therefore important as lesson plans are derived from the curriculum.

Further as curriculum design in turn is influenced by the conceptions of teaching (Biggs, 1999), which influences the lecturer's approach to planning, implementation and evaluation in the classroom. In RUB, t conceptions promoting student-centredness are evident in the policy documents - the '*Wheel*' and the Centre for University Learning and Teaching report (RUB, 2008). These clearly set the path for RUB academics to follow while designing the programme documents, writing the module descriptors and then implementing them in the classrooms as lessons (see Appendix 1.1 on Context of the Study pp 16-21 for further details on the policy enactment and quality control).

Implementation

In this section dimensions of the implementation phase in the classroom are discussed. The implementation phase involves putting the lesson plans into action and is about the way that teachers *teach* in order to promote student learning through their lessons. During lesson implementation, teachers are required to ensure that the lesson plan is put into action while also attending to set events taking place in the class such as student attendance and classroom management.

Teachers may restrict or facilitate learning opportunities during the implementation phase in their moment-by-moment decision-making, by asking closed rather than open questions, for example, or by constantly interrupting students (Nystrand, 1997; Walsh, 2006) . Their constant orchestrating during the lesson in seeking clarification when a contribution is not clear, paraphrasing a student's contribution for the rest of the class, 'shaping' the language used by students and

‘scaffolding’ new concepts and language as and when necessary reflects the key role of the teacher during implementation.

Thus teachers can either be facilitators helping students to take on an active role and learn or take an authoritative role as a transmitter of knowledge and thus compel students to take on the role of passive learners. On the other hand they can provide the input and facilitate understanding and application of it.

During the implementation phase, teachers utilise various strategies such as conventional lectures, interactive lectures, group discussions, cooperative learning, question and answer techniques and activity-based learning as set out in the *Wheel* (Royal University of Bhutan, 2010, p. 118). When used effectively, these strategies promote the development of knowledge, skills and values among students (Royal University of Bhutan, 2010b). There are several benefits attached to using strategies effectively during the implementation phase:

- Interaction is greatly enhanced in that appropriate strategies encourage interaction in various forms (with other students, teacher and the content knowledge) leading to enhanced learning experiences for students;
- Students are provided with opportunities to be actively engaged in discussions, and learning activities;
- Deep structure and active learning can be promoted by allowing students to use critical and analytical skills, and to apply higher levels of thinking to tasks assigned during the lessons; and
- Students learn to become independent and reflective learners and take more responsibility for their learning.

However it must not be assumed that the strategies mentioned above are the best methods to be used while implementing lessons in the class. This is because as research has established that there is no one method or set of methods that can be described as the best set of practices (Entwistle, 2008). Weimer (2012) notes that searching for the best way to teach assumes a kind of simplicity about teaching and learning that does not

exist. Entwistle (2008, p. 28) asserted: "*In the end, 'best practice' is whatever helps students to engage more deeply with the subject and to become more actively responsible for their own learning*."

To ensure effective learning, the activities in the implementation phase must be aligned with learning outcomes and assessment tasks. Several factors such as whether the environment is conducive to learning, the existence of an appropriate and relevant curriculum, suitable trained and qualified teachers, the resources available, and the willingness of learners, influence the success or failure of a lesson during implementation.

Implementation is discussed further in the category Teaching and Learning Approaches of the analytical framework (pp. 52-60) to provide the base for the analysis.

Evaluation

Evaluation as described by Kandlbinder & Peseta (2011) is one of the most powerful motivational influences on learning. It is an integral part of an instructional process and serves a number of useful purposes (QUT Professional Experience Unit, 1998). It is used for diagnosis to identify individual or class learning difficulties and to seek causes; for a check to determine readiness when learners are ready to proceed to the next step; for progress checks to determine the extent of learning over a limited period and for achievement checks to measure learning over relatively long period (QUT Professional Experience Unit, 1998, p. 15). Well-designed and well-executed evaluation can also act as a learning incentive to students, and support self-regulated learning strategies (Stony Brook University, 2011). Research shows that properly used evaluation strategies can encourage students to keep up with the material and enhance students' academic engagement and achievement in college (Chickering & Gamson, 1987). Therefore, evaluation of student learning is a very important component in course design and requires a lot of careful thought in planning. The close relationship between goals and effective evaluation is expressed by the National Academy for Academic Leadership (n.d), after Tyler, which maintains that a lack of goals means ineffective evaluation.

Evaluation is distinct from assessment, but both can help students to build lifelong learning skills. Assessment includes feedback in relation to the knowledge, skills and attitudes demonstrated by the students, for the purpose of improving future performance and achieving learning outcomes. Evaluation determines the level of quality of a performance or outcome, and enables decision-making based on the level of quality demonstrated. These two processes are complementary and necessary in education.

Both processes can be formative – i.e. undertaken while an educational process is on-going, or summative – i.e. performed at the conclusion of an educational process (Baehr, 2010). In the *Wheel* references are made to the use of different types of assessments – formative, summative and diagnostic for student learning (Royal University of Bhutan, 2008, pp. 88-117).

The use of the term 'evaluation' needs to be clarified to avoid confusion. 'Evaluation' has been used for two different purposes in this study. The first is related to how the lecturers evaluate students' learning during the course of the lessons to ensure that learning occurred. This kind of evaluation in classroom practices does not assign grades, but feedback is provided, and the lecturer closely monitors and assists the students during their learning.

The second usage of 'evaluation' refers to evaluation by the researcher, in making judgments regarding the practices observed in the colleges. Focus is on evaluation of the lecturers' planning, implementation, and evaluation practices in applying the seven categories of analysis (Table 3.3. – Phases of the analysis process).

More on 'evaluation' will be discussed in the category 'Assessment' at a later stage of the chapter.

Framework for analysis of lessons

The framework for analysis covers three phases of the first framework viz. *planning, implementation, and evaluation* of lessons, observed in the colleges of RUB. Seven categories of criteria were selected as they are closely linked to the three phases. While the three phases are the central focus of the analysis, the categories assist in in the

examination of each phase in some detail in the lessons and together they form a matrix (Table 2.3). In the first analytical framework the focus is on the phases, and subsequent analyses i.e. in planning phase the planning practices observed, and in implementation phase analyses of what occurred in the lessons and then in the evaluation judgements are made about the planning and implementation practices of the selected lecturers. Further descriptive indicators were developed for each category as the second analytical framework (Table 2.4) in order to ensure that they were applied rigorously across the case studies. The categories and associated indicators were conceptualised and developed from relevant literature in order to describe and analyse the core practices of the lecturers. The seven categories and associated indicators (Table 2.4) are used as the lens through which the lessons were analysed. Category definitions appear below.

Table 2.3. Matrix of the First Analytical framework showing phases and categories

	Phases							
Categories	**Planning ➔ Implementation➔ Evaluation🡻**	LOs	Teaching and Learning Approaches	Content Knowledge	Assessment	Resources	Role of Teacher	Role of Student
	LOs	*						
	Teaching and Learning Approaches	*	*					
	Content Knowledge	*	*	*				
	Assessment	*	*	*	*			
	Resources	*	*	*	*	*		
	Role of teacher	*	*	*	*	*	*	
	Role of Student	*	*	*	*	*	*	*

A well-developed analytical framework is particularly important for multiple-case studies. Since the nature of this study called for multiple case studies (see Chapter Three: Methodology), the analytical framework helped to ensure comparability of data

across case studies particularly at the cross-case analytical stage, without impeding the flexibility needed to do justice to each individual case study. Resources such as *Seven Principles for Good Practice in Undergraduate Education* (Chickering & Gamson, 1987), *The Queensland School Reform Longitudinal Study, Classroom Observation Manual (The School Reform Longitidinal Study Team, 2001)*, *Metropolitan State University, Urban Teacher Programme*, Minneapolis (Center for Teaching and Learning, 2009), *Emmanuel College School of Education*, Georgia, USA (School of Education, 2009), and *Kentucky Department of Education, Highly effective Teaching and Learning* (Department of Education, 2009) were explored during development of the analytical framework and each contributed, even if only informally, to the development of the framework.

The seven categories were selected because of their significance and potential for application to the three phases of the study. Specific indictors for each category were selected for their relevance and application to the framework. The indicators describe the categories in specific details. For example, the indicator *Provides opportunities for interaction with each other and with the lecturer* (taken from the indicators on the teaching and learning approaches category) clearly specify what to look for during the data collection and analysis of interaction in the class. The indicators directed the focus of the analysis of data and assist in addressing the research questions.

Table 2.4 shows the second analytical framework, which was derived from the discussion of the extant literature as part of an emergent theory and justified against the benchmarks (Leshem & Trafford; Symth, 2004) identified earlier (see page 40 for sources of the benchmarks). It includes the seven categories and associated indicators. A deductive approach is now used to discuss the elements of the framework following a discussion of the overall framework.

Table 2.4 – The Second Analytical Framework: Seven categories and their associated Indicators

Categories	Indicators
Learning Outcomes *Focus on what the student should know/understand and/or realistically be able to do at the end of a period of learning (lesson/module)*	Specific Measurable Achievable Relevant Time-Scaled
Teaching and Learning approach *Approaches to teaching that influence, motivate and inspire students to learn*	Organises active/passive engagement with learning tasks
	Provides opportunities for interaction amongst students and with the lecturer
	Initiates vigorous and critical interaction with knowledge content (invokes deep learning)
Content Knowledge *Knowledge of discipline-specific content and curriculum appropriate for his/her teaching field*	Communicates depth and breadth
	Links content to other subject areas and everyday life of students (relevance)
Assessment *Assessment that measures students' learning/expected learning outcomes*	Selects, constructs and utilises appropriate assessment strategies (formative and summative) which are aligned with the learning outcomes.
	Assesses prior knowledge of student learning
Resources *Resources to support students' learning*	Use of appropriate and variety of resources to enrich learning
Role of Teacher *Helps the student to learn.*	Creates conducive learning environments
	Encourages students to accept responsibility for their own learning and accommodates the diverse learning needs of all students
	Demonstrates an understanding and in-depth knowledge of content and maintains an ability to convey the content to students
Role of Student	Accepts responsibility for learning
	Actively participates in the class
	Collaborates/teams with other students

Learning Outcomes

Learning outcomes are statements of what a learner is expected to know, understand and/or be able to demonstrate at the end of a period of learning. They are explicit statements about the outcomes of learning.

In student-centred learning, LOs should be focussed on learning and not on coverage of the content or on the teacher teaching. They focus on the learner's behaviour that is to be changed by identifying precisely what should be learned. LOs serve as a guide for the generation of content, instruction, and evaluation; thereby conveying to learners exactly what is to be accomplished (Biggs, 2003; Kennedy, Hyland, & Ryan, 2006).

Bloom's Taxonomy of Educational Objectives (Bloom, Engelhart, Furst, Hill, & Krathwohl, 1956) is particularly useful because it associates particular verbs with each level of learning (Kennedy et al., 2006). Bloom's Revised Taxonomy (Anderson & Krathwohl, 2001) has been applied in the analyses. The Revised Taxonomy is more suitable to use as the rigid hierarchy between categories in the original Bloom's Taxonomy was softened up and over lapping between categories was provided (Krathwohl, 2002). The original taxonomy has a cumulative framework as it progresses according to the degree of difficulty, and based on the need to perform a previous one for the next step (Krathwohl, 2002). Levels of thinking based on the revised taxonomy would be uitilsed to examine lower and higher levels of thinking incorporated in the LOs. More importantly, the use of *specific* and *active* language makes the expectations clear and informs students of the standards by which they will be assessed and also ensures that student and teacher goals are aligned. Keane (2009) reports that using non-specific verbs/phrases leads to ambiguity, so students and lecturers are likely to interpret them differently.

LOs can take many forms and can be broad or narrow in nature. It is not uncommon, however, to find confusion among learning outcomes, and aims and objectives. Indeed many regard learning outcomes and objectives as synonymous

(Adam, 2004, p. 6). By emphasising what students should know and be able to do LOs demonstrate the relative importance of the process, whereas objectives are the intended result of instruction.

A shift in thinking, from objectives to outcomes has contributed to the paradigm shift from teacher-centredness to student-centredness. In support of this idea, (Adam, 2004) records that, in terms of curriculum design and development, LOs are at the forefront of educational change as they represent a change in emphasis from teaching to learning. However, some see this trend as a linguistic game, with the word 'outcome' substituted for the word 'objective' in order to maintain political correctness (Schwarz & Cavener, 1994 as cited in Wittmann-Price & Fasolka, 2010). In relation to medical education, Prideaux (2000) called this phenomenon "the emperor's new clothes" in medical education.

Adam (2004) notes that the articulation of LOs is not just an isolated tool at the level of curriculum design, but their use also represents an approach that plays a significant role in the wider educational context in areas as diverse as the integration of academic and vocational educational and training, the assessment of prior experiential learning, the development of lifelong learning qualifications frameworks and the development of credit transfer and accumulation systems. In higher education, LOs have become the bedrock of the infrastructure that determines quality assurance processes in universities throughout the world (Scott, 2011), and they represent one of the essential building blocks of transparent higher education systems and qualifications (Adam, 2004). LOs are set to play an important part in twenty-first century approaches to higher education, and the reconsideration of vital educational questions such as to the what, who, how, where, and when of teaching and assessment (Adam, 2004).

Classification of Learning Outcomes

There are different kinds of learning outcomes. Some are simple, requiring only the simple recall. Others are complex and require problem-solving or evaluation skills. One of the popular categorisation schemes employed in the preparation of LOs is Bloom's (1956) Taxonomy of Educational Objectives, which provides a useful starting

point for the writing of learning outcomes. It identifies three overlapping domains/categories of learning:

- The Cognitive domain – which encompasses intellectual or thinking skills;
- The Psychomotor domain – which encompasses physical skills or the performance of actions; and
- The Affective domain – which encompasses attitudes and values.

Bloom included an ascending order of complexity within each of the domains. The taxonomy is a means of expressing the range of intellectual skills and abilities in qualitative terms. Additionally, Bloom identified several "levels," in each domain, each with a number of verbs to describe that level in written objectives.

The verbs indicate the relevant category and are the key to writing learning outcomes. There have been additions to the list of verbs since Bloom's original publication (Kennedy, 2009). The revised Taxonomy provides a framework through which one can build upon prior learning, and develop more complex levels of understanding. This has the benefit of focusing attention on higher levels of learning when the content requires higher-level understanding. The revised Taxonomy will be used in this study to identify the levels of thinking incorporated into the LOs.

Types of learning Outcomes

Allan (1996) described the general aims of higher education in terms of desired learning outcomes, classifying them into subject-based, personal-transferable and generic-academic outcomes. Subject-based outcomes are domain-specific while personal-transferable and generic-academic outcomes include general skills such as critical thinking, using information, teamwork and communication skills. However Allan's classification has been criticised on the basis that the demarcations between personal-transferrable and generic-academic outcomes were not very clear as there is no description of the relationship between these concepts, and there is very little indication as to the nature of classification (Kemp, 1999, p. 5). Thus, as proposed by (Adam, 2004, p. 6) the most common sub-divisions are between subject-specific outcomes that relate to the subject discipline and knowledge and /or skills particular to it. Generic outcomes (sometimes called key transferable skills) that relate to any and all disciplines e.g.

written, oral, problem-solving, information technology, and team working skills are also common. The identification of generic skills is important in enhancing the employability of graduates, whatever their discipline (Adam, 2006). This classification could be applied to the analytical framework in an examination of the kinds of LOs written in universities. In this study, the LOs will be identified as subject-specific and personal-generic and this is consistent with the definition of LOs that appears in the *Wheel* (Royal University of Bhutan, 2010b, p. 81).

Use of SMART Criteria for Learning Outcomes

The SMART Criteria was used as indicators to analyse learning outcomes in the planning, implementation, and evaluation phases of the study. This is because the definition of LOs in the *Wheel of Academic Law* reflected the SMART criteria:

> [LOs are] *the outcomes of the learning process. These are statements describing what the students should know or be able to do as a result of learning. It also states that outcomes should be specific (measurable, achievable, relevant, realistic and time-limited). They usually include subject-based outcomes, such as knowledge, comprehension, application of knowledge; and more personal outcomes such as the ability to analyse, and to be self-reflective* (Royal University of Bhutan, 2010b, p. 81) .

Additionally SMART was chosen as an analytic tool for evaluation of the learning outcomes (LOs) because they represent a change in emphasis from 'teaching' to 'learning', adoption of a student-centred approach in contrast to traditional teacher-centred one.

There is little documented evidence of the history of the SMART acronym and its substance. George T. Doran's (1981) article "*There's a S.M.A.R.T. way to write management's goals and objectives*" appeared to be the first published article on the topic. Doran proposed that the following criteria should be present in order for the S.M.A.R.T. objective to be met:

> ***S****pecific – target a specific area for improvement*
> ***M****easurable – quantify or at least suggest an indicator of progress*
> ***A****ssignable – specify who will do it*
> ***R****ealistic – state what results can realistically be achieved, given available*

resources

***T**ime-related – specify when the result(s) can be achieved* (Doran, 1981, pp. 35-36).

The following explanations of the SMART acronym have been extracted from *Learning outcomes and assessment guide* (University of Westminster, 2001), and *Guidelines for writing effective learning outcomes* (University of Malta, 2009) models and will be referred to during the analysis:

***S**pecificity* – The 'specific' criterion endorses the idea that learning outcomes should state precisely what the student is expected to achieve in terms of knowledge and skills in order to be successful. Such activity might be intellectual in nature or practically oriented skills. Specific criteria should be well defined, clear and should refer to a behaviour. Consultation with Bloom's Revised Taxonomy is a useful way to write specific LOs as it assists choosing active verbs and thus generation of specific LOs (Kennedy et al., 2006). The LOs should be presented in terms of what the student will be expected to know (not should) or be able to do, to as a result of the learning.

***M**easurability* – The 'measurable' criterion states that the learning outcomes must be open to assessment, that is, they must be able to accurately assess whether or not the outcomes have been achieved. The measurability criterion for success consists of three parts – i) *behaviour* which is the action verb, used to describe what participants will be able to do as a consequence of a learning activity; ii) *condition* which is the environment or situation in which the student will perform the behaviour or the tools/information they will be given in order to demonstrate their learning, and iii) *criteria* which describes the limits or range of an acceptable response.

***A**chievability* – The learning outcomes should be within the range of abilities of students, and should represent a threshold of achievement for the lesson or unit. An **a**chievable outcome is one that can be demonstrated by evidence, or observed. In determining what is achievable for assessment, students' level of achievement on entry, including consideration of any pre-requisite requirements, should be taken into account.

***R**elevant* – learning outcomes should relate to the key aims of the programme. A

relevant learning outcome is one that prepares the student for future experiences or coursework. Learning outcomes should be reasonable given the available resources and should be neither too easy, nor impossible, to attain.

Time scaled – learning outcomes must be achievable within the duration of the lesson/module/programme.

In the three decades since the SMART acronym was first described, it has since been effectively incorporated into many fields, including education.

Alignment of LOs with teaching, learning and assessment

Alignment refers to what the teacher does in order to help support the learning activities and thus achieve the learning outcomes (Biggs, 1996; McCarthy, 2011). Aligning the assessment with the learning outcomes means that students know how their achievements will be measured (Biggs, 1999). Toohey (1999) recommends that the best way to help students understand how they must achieve learning outcomes is by clearly setting out the assessment techniques and the assessment criteria. In terms of teaching and learning, there is a dynamic equilibrium between teaching strategies on one side and learning outcomes and assessment on the other side (Biggs, 1999; Kennedy, 2009). Ensuring alignment between teaching methods, assessment techniques and learning outcomes is a challenge for teachers but doing so helps to make the overall learning experience for students more transparent. Lack of clarity in this area is almost always associated with negative evaluations, learning difficulties, and poor student performance (Biggs, 1999 ; Kennedy, 2009).

Biggs (1999) asserts the key to alignment is that the components in the teaching system, especially the teaching methods used and the assessment tasks, be aligned to the learning activities assumed in the learning outcomes. He argued that in such a set-up the learner cannot escape learning as the LOs, teaching and learning approaches and assessment are closely linked with the intent to promote learning (Biggs, 1999).

It is important that the assessment tasks mirror the learning outcomes since, as far as the students are concerned, the assessment *is* the curriculum; assessment always defines the actual curriculum (Ramsden, 1992). To the teacher, assessment is at the end

of the teaching-learning sequence of events, but to the student it is the heart if not it's beginning. If the curriculum is reflected in the assessment, the teaching activities of the teacher, and the learning activities of the learner are both directed towards the same goal. In preparing for the assessment, students will be learning the curriculum (Biggs, 2003).

Potential problems with Learning Outcomes

Although LOs have achieved an exalted status, bolstered by the ubiquitous of references to them at conferences, in official documents, and communiqués in higher education (Adam, 2004), there remain reservations about the adoption of learning outcomes in some parts of the education community. Two main concerns are expressed: (i) basic conceptual/philosophical objections and (ii) practical/technical objections.

Philosophical objections

In terms of philosophy, learning outcomes are seen as prescriptive and limiting to the learning processes of higher education. According to (Adam, 2004) LOs narrow the conception of education and stifle the diversity of the learning and hence the university. The framework presented by LOs could limit learning because of a lack of intellectual challenge to some learners. LOs may be viewed as reductionist in nature. Moreover there is the danger of the curriculum being assessment–driven, thereby narrowing the scope and durability of LOs. In addition, inadequate common guidelines for drawing up LOs could lead to confusion for both teachers and students Kennedy (2009, p. 62) argued.

Practical/technical objections

Not all LOs can be measured, and some are difficult to define. Hussey and Smith (2002) have argued that LOs are contentious, as they appear to lend a precision and a measurable specificity to the learning process that cannot exist. The claims of clarity, explicitness and objectivity of learning outcomes are, according to them largely spurious. They further assert that LOs give the impression of precision only because they are unconsciously interpreted against a prior understanding of what is required. The meanings of the action verbs (descriptors like describe and analyse) are relative to

the situation, the subject matter, and the level. They also assert that teachers/educators may interpret the same action verb/descriptors differently, because various interpretations are possible, making it neither practical nor useful to try to specify learning outcomes with the kind of precision that is being sought. Hussey & Smith (2002, p. 227) ultimately assert that the LOs will remain ambiguous whatever descriptors are used.

Learning outcomes can be insensitive to the requirements of different disciplines (Hussey & Smith, 2002; Maher, 2004). The pattern of learning and the skills appropriate at different levels vary from subject to subject. The sequence identified by the descriptors 'describe',' understand' and 'analyse' may well represent a seamless progression in cognitive terms, but it remains at odds with the empirical knowledge of practitioners and suggests a unidirectional movement that distorts the real process.

Furthermore, Melton (1996) questions the reliability of assessment based on learning outcomes as the best way of responding to the needs of the students with different abilities, and who progress at different rates.

On the other hand, Prideaux (2000, pp. 168-169) argues that although outcomes may be difficult to define or measure, they may also be educationally and professionally significant and worthwhile, and should not, therefore, be omitted because of their supposed 'imprecision'. Creativity, judgment, and responsibility must not be ignored because they are qualities that are not readily translated into specific outcomes.

Thus, Adam (2004) argued that the creation of LOs is not a precise science. Generation of LOs requires considerable thought and care must be taken to avoid the creation of a learning strait jacket. Much of the criticism of LOs stems from the argument that they only have meaning if their context, and the prior knowledge they are built on, is understood (Scott, 2011, p. 6).

Account needs be taken of the requirements of individual subject disciplines as well as the way in which learning outcomes are addressed in learning and teaching settings (Coxall et al., 2001 as cited inMaher, 2004, p. 50). The production of learning outcomes should not be seen as a 'once and for all' activity, but an iterative process that

involves both learners and teachers as active participants in their development.

Criticisms (e.g. Gosling & Moon, 2001; Hussey & Smith, 2002) have also been levied against approaches to curriculum development that rely on a common set of generic level descriptors such as those based on Bloom's Taxonomy for framing learning outcomes. Hussey and Smith (2002) vigorously argue that the view that cognitive development is unilinear and that student's move from describing to understanding to analysing are too simplistic. Maher (2004, p. 49) supports the above by stating that disciplines differ in terms of the patterns of learning and skills required across different levels.

Adam (2004, p. 22) summarises the role of LOs, noting that they are not a universal panacea for all educational problems facing higher education, and that they create distinct challenges that should not be underestimated. However, it is arguable that since the advantages are many, it might not be possible to have a meaningful higher education system without their widespread and consistent use.

Hidden learning outcomes

The concept of the 'hidden curriculum' encompasses an important objection to the pre-specification of LOs. The hidden curriculum refers to a range of factors (attitudes, opinions, values) that students learn, not from the planned lesson based on LOs, but simply from the experience of being in the class. These are derived from the implicit messages conveyed by the structure and organisation of the class, the relationships between teachers and students, the classroom management rules, the assessment system, and the various subcultures that exist in the classrooms (Margolis, Soldatenko, Acker, & Gair, 2001). Giroux (1983) defines hidden curriculum as those unstated norms, values, values, and beliefs embedded in and transmitted to students through the underlying rules that structure the routines and social relationships in schools and classroom.

Less positive aspects of the 'hidden curriculum' can also arise when undesirable behaviours and attitudes, such as indifference, hostility, and biases, emerge in the classrooms. The unintended and unplanned nature of these behaviours can allow for

them to be conveyed in the classrooms. It is not uncommon for learning outcomes, such as transmission of norms, values and beliefs, that were not intended as part of the lesson, to be conveyed in the classroom and the social environment (Giroux & Penna, 1983). Thus as asserted by Jackson (1968) the hidden curriculum can serve as a valuable framework within which examination of the social functions of higher education occurs.

Teaching and Learning Approaches

For the second category - *teaching and learning approaches* - as examined in the literature (Chapter Two) the discussions on conceptions of teaching and learning will be based on approaches that promote deep and active learning in the classrooms. The subsequent section will describe and analyse literature on the specific indicators identified in Table 2.4. The discussion will take into account planning, implementation and evaluation implications of the category. Examination of teaching and learning conceptions as discussed in the preceding sections in this chapter provide insight into the ways that teachers teach and students learn.

Organises active engagement with learning tasks

Learning is, by its nature, an active endeavour (Meyers & Jones, 1993). The ability of the teacher to organise and facilitate student learning in an organised and productive learning environment is critical to achieving positive learning outcomes. In order to do this the lecturer has to demonstrate knowledge of effective strategies to teach and support student learning; set up a developmentally appropriate classroom environment to encourage purposeful learning and participation of students in independent and group work (Oliver & Reschly, 2007). The processes involve interaction between students and lecturers to enhance participation, involvement, and cooperation in class. There are several ways in which effective learning can be encouraged and effectively implemented in classrooms. High levels of active engagement during lessons are associated with higher levels of achievement and student motivation (Ryan & Deci, 2000 as cited in Sakyo & Turner, 2007). A compelling body of evidence suggests that student engagement plays a vital role in learning and in how

students experience school, and predicts future learning engagement (Voke, 2002). Typical kinds of active/passive engagements that take place in college classrooms are lectures (conventional and interactive lectures), group discussions, individual activities, and science laboratory activities.

Lectures

Lectures are widely used in Bhutan. Lectures are probably the best teaching method for communicating conceptual knowledge and where there is a significant knowledge gap between lecturer and audience (Charlton, 2006). However Laurillard (2002, p. 91) criticises lectures as 'a means of information transmission and dissemination, for its non-interactive linear presentational mode'. She asserts that it is a very unreliable way of transferring the lecturer's knowledge to the student's notes.

Nevertheless lectures continue to persist as a pedagogical tool and are still flourishing today in the form of podcasts, the Technology, Entertainment and Design (TED) talk, and the 'smart' lecture hall (Frieson, 2011, p. 95). Lammers and Murphy (2002) assert that lectures will therefore continue as the dominant form of university instruction. As long as class sizes continue to increase and university budgets tighten, lecturing will remain a dominant teaching method (S. Brown & Race, 2005; R. P. Perry & Smart, 1997). Knowing how to lecture well, therefore, is a crucial skill to master. Effective lecturing is characterised by enthusiasm and expressiveness, clarity, and interaction (H. G. Murray, 1997). In traditional lectures, university teachers 'talk at' their students and it is appropriate for students to try to absorb as much as possible by listening carefully and taking notes.

Research shows that students like well structured, well presented and relevant lectures and that they are likely to learn more under such conditions (Lammers & Murphy, 2002). For that reason, as suggested by Chickering and Gamson (1987), students must do more than just listen: they must read, write, discuss, or be engaged in solving problems in the classroom. Students 'do not actively listen at all in formal lectures unless they are broken up with multiple rest periods and activities that help to lift attention levels back again through the use of interactive lectures' (Revell &

Wainwright, 2009, p. 3). Active involvement of students requires that they be engaged in higher-order thinking tasks that include analysis, synthesis, and evaluation, thereby promoting deep and active learning. As S. Brown and Race (2005) point out, the transmit-and-receive model is clearly out of date, not least because the receivers were rarely tuned in, but also because nowadays students just have to log on to the university intranets and the web to have a world of information at their fingertips. Pedagogic scholars have thus shifted away from this traditional view and now emphasise 'the lecturer as facilitator rather than teacher whose primary role is to give students the tools to learn for themselves' (Revell & Wainwright, 2009, p. 5).

Interactive Lectures

A variation of the traditional lecture is the now popular interactive lecture. An interactive lecture is an elegant way for lecturers to engage students intellectually and involve students as active participants. Making lectures as interactive as possible is considered crucial to achieving higher levels of attention and retention (Jenkins & Pepper, 1988 as cited in Revell & Wainwright, 2009, p. 3). Note 'classroom interaction' is discussed in the following section.

Studies have shown that students prefer strategies promoting active learning over traditional lectures (Prince, 2004). Other research studies evaluating students' achievement have demonstrated that many strategies promoting active learning are comparable to lectures in promoting the mastery of content but superior to lectures in promoting the development of students' skills in thinking and writing (e.g. Bonwell & Eison, 1991). Further, some cognitive research has shown that a significant number of individuals have learning styles best served by pedagogical techniques other than lecturing (Bonwell & Eison, 1991).

The practice of interactive lectures in the classroom is vital because of the powerful impact upon students' learning. Consequently, teaching requires that lecturers be knowledgeable about the many ways strategies promoting active and deep learning have been successfully used across the disciplines. Some of the strategies suggested for making lectures interactive are active engagement and cooperative student learning in

lectures (S. E. Jones, 2007) as well as think-pair-share, demonstrations and role-play, short writing tasks, small-group discussions, sharing in pairs or even rest breaks (M. S. Young, Robinson, & Alberts, 2009). Other engagement strategies like repetition, trial and error, and posing questions move the brain into active and constructive learning. These can be used to break up the lecture for a brief time (Stead, 2005). Engagement triggers (Hoyt & McGoldrick, 2012) are used in interactive segments that capture and maintain student attention. The lecturer incorporates an activity that allows students to apply what they have learned or gives them a context for upcoming lecture material.

Research has shown that development of critical thinking skills leads to deeper learning for students and active engagement with learning (Carlton University Science Education Resource Centre, 2011). Incorporating activities into lectures is one way to get students to become actively engaged, and result in deeper learning (Lorain, 2012). Actively engaging students can increase student interest and raise their perceptions of their own learning.

Such techniques encourage students to take greater responsibility for their learning (Niemi, 2002). Moreover, the benefits of active learning in lectures are maximised when tasks are authentic and reflect how knowledge is used in real life (Herrington & Herrington, 2006). The Herringtons elaborate that when students have opportunities to adopt multiple roles and consider different perspectives and when they are required to articulate their thinking and reflect on the ideas of others, authentic learning takes place.

When students have opportunities to use lecture knowledge actively, they can develop an understanding of when and how knowledge can be applied in different contexts. Bransford, Brown, and Cocking (2002, p. 16) for example, report that deep learners transform factual knowledge into usable knowledge. This process requires critical thinking skills, integration of knowledge over time and subject matter, a theoretical application of knowledge to practical situations and higher order skills of analysis and synthesis (Biggs, 1999; Entwistle, 2000; Prosser & Trigwell, 1999b; Ramsden, 2003).

To ensure that students are appropriately engaged, lecturers must observe and analyse what goes on in class, determine specific problem areas on which to focus, and take decisive action to correct it. Problems that arise may be due to the students' lack of attention to task, the lessons' inherent lack of worth, or a poor classroom environment, but appropriate strategies for each deficit can be implemented to improve engagement (M. B. Martin & Furr, 2010, p. 19).

Provides opportunities for interaction amongst students and with the lecturer

The term 'classroom interaction' refers to the interaction between teacher and students and among the students themselves in the classrooms. According to Brown (2001 as cited in Moss, 2005, p. 5) interaction is at the heart of communicative competence. Brophy (1986) found a positive relationship between classroom interaction and students' level of achievement. The teacher has to utilise a variety of interactional strategies to encourage students to learn in different ways. Fassinger (1995, p. 82) explained that whether the teaching and learning approaches used are lectures or discussions or activities, student participation seem to nurture learning. She further stated that facilitating students' willingness to raise questions or offer comments in class is likely to enhance their intellectual development. The most direct way to enhance students' participation is by adopting the principles of collaborative learning Bishop (2000) argues. This works well for small group activities in which students are assigned a task to work on and the lecturer facilitates and monitors the activity. For larger numbers of students other strategies would have to be utilised to ensure that most, if not all of the students interact with each other and the lecturer.

Cowie, Moreland, Cooper, and Jones (2005, p. 4) found that teachers' confidence in their own pedagogical content knowledge (PCK) proved crucial in their decision to engage in interaction with students. The teachers were more knowledgeable about students' range of understandings about a task and confident in their own ability to respond constructively to the students' questions and comments. As a result of their pedagogical content knowledge, teachers are also better able to appreciate and build on divergent student ideas in productive ways.

Contemporary research confirms that PCK for teaching is multidimensional (Hill, Schilling, & Ball, 2004) and that it positively affects student learning (Hill, Ball, & Schilling, 2008). More recently, with the introduction of Technological Pedagogical Content Knowledge (TPCK), learning can become more interactive (Mishra & Koehler, 2006).

Uses questions to promote interaction

Well-structured, purposeful questions are essential in order to maximise interaction and the other benefits associated with their use in the classroom. In classroom settings, teacher questions are defined as cues or stimuli that convey to students the content elements to be learned and directions for what the students are to do and how they are to do it (Cotton, 2001). It is one of the most popular modes of teaching (Tan, 2007). Teachers use questions to promote interaction, manage student behaviour and classroom activities, promote students' inquiry and thinking, and assess students' knowledge or understanding.

Berci and Griffith (2005, p. 407) assert that good teaching is good question asking; questions that motivate, evaluate, and keep the thinking process alive – is an art every teacher should master. One way to encourage active learning is to ask questions (Lever, 2007). She states that using good questioning skills are one of the most difficult teaching techniques to develop. A good question is an invitation to think (Fisher, 1996). ‘Good' questions are defined as those that demand more than recall, but are educative and open (Sullivan, 2012). Questions can assist students to explore more deeply, and thus provide more thoughtful responses. Skilful questioning leads students to make their own discoveries, create their own learning. Chin (2004) argues that flexibility in questioning is needed; the teacher adjusts questioning to accommodate students’ contributions and responds to students’ thinking in a neutral rather than evaluative manner.

In addition to these reasons for using questions, Morgan and Saxton, (1991 as cited in Brualdi, 1998 para. 2), list some of the reasons teachers ask questions. They help the teacher to keep students actively involved in the lesson; they give students

opportunities to express their ideas and thoughts and to think critically; they enable other students to hear different explanations of the materials by their peers; they help the teacher to pace the lesson, moderate student behaviour, evaluate student learning and revise the lesson as necessary. Teachers' questions give the students the opportunity to connect what they know with what they need in order to examine and reflect on their own thinking (Fisher, 1996). Some studies indicate that teachers also view questioning as a basic way to stimulate student thought and to guide the development of knowledge. Capel, Leask, and Turner (1999) state that teacher should consider questioning to motivate the students. All this suggests that there are a variety of purposes and reasons for asking questions in the classrooms by teachers. Asking questions can be a powerful tool to turn a student from a passive observer in the classroom into an active learner.

However when the questions and the questioning technique are not used effectively, they may stunt communication and not lead to effective learning. For example in the study of Wragg (1984), e.g. not looking at pupils when asking a question, talking too fast or at an inappropriate volume or not being clear, were identified by teachers as the most common mistakes. Classroom management problems can also arise in large classes if teachers are not aware how their questioning techniques affect the students.

Bond (2007) pointed out that teachers seldom write down their questions while planning; instead they generate them extemporaneously during the lesson. Questions such as 'is everything clear?' are not the best way to use questions in classrooms. Researchers maintain such questions are vague and do not promote cognitive growth. Specific probing questions that engage higher order thought are far more effective Chin (2006) argues. Ineffective use of questions can lead to students disengaging from deep, high-quality thinking and can result in learners who misbehave out of confusion or boredom. Bond (2007) encourages teachers to generate questions that are clearly written, appropriate for the students' ability, and sequenced in a logical way.

Open questions can facilitate divergent thinking, implying that a range of possible answers exist, and provoke students to respond at a variety of levels requiring higher levels of thinking. Open-ended questions are ideal for developing skills such as

inferring, predicting, verifying and summarising, as well as eliciting more language (Darn, 2010). On the other hand 'convergent' or 'closed' questions have more narrowly defined correct answers which can be recalled from memory and require little reflection or originality.

Classroom interaction can be enhanced and positive effects on learning result from the effective use of questioning.

Initiates vigorous and critical interaction with knowledge content to invoke deep learning

Knowledge is organised and structured in networks of related concepts. Accordingly, new knowledge must connect to, or build upon a framework of existing knowledge (Zull, 2002 as cited in Wirth & Perkins, 2007). Learning involves building mental models (schema) consisting of new and existing information. The richer the links between new and existing information, the deeper the knowledge and the more readily it can be retrieved and applied in new situations according to Wirth and Perkins (2007, p. 12). Making rich links involves an iterative process of building, testing, and refining schema that organizes knowledge into conceptual frameworks. While doing this, they "construct" their own knowledge (Wirth & Perkins, 2007, p. 12). Such activity allows students to understand the material for themselves, promote deeper learning and will facilitate their becoming critical independent learners.

Content Knowledge

In this section the third category, content knowledge included in the lessons would be explored to find out whether there was adequate content (depth and breadth) covered in the lessons, and whether they were relevant to student learning. The literature is based on a pedagogical perspective, as it may not be possible to assess the efficacy of the content in all the subject areas.

Content Knowledge is the knowledge about the actual subject matter that is to be learned or taught. As defined by Grossman, Wilson, and Shulman (1989); Shulman (1986) content knowledge includes knowledge of the subject and its organising structures. Jerome Bruner (1968) refers to the structure as the principles, organisation

and methods of discovery of the subject-matter that make up the discipline.

Relevance of content knowledge

The key focus for relevance is the content knowledge included in subjects to enable students to achieve the learning outcomes.

The selection of content knowledge is dependent upon several factors such as the requirements of the course, curriculum standards/frameworks, accountability systems, teachers' familiarity with specific content and pedagogy, teachers' perceptions of the needs of the students, views of the public and other key stakeholders (Weiss, Pasley, Smith, Banilower, & Heck, 2003). Content is also selected because it is necessary for the understanding of something else or because it might be pre-requisite knowledge for later learning. Analysis of the unit learning outcomes or use of an integrating device allows teachers to develop a learning sequence for the content.

Depth and breadth of content knowledge

Depth versus breadth of content knowledge relates to the appropriateness of content at different levels in higher education. The depth versus breadth debate is one of the most long-lived and contentious conflicts in education (Schwartz, Sadler, Sonnert, & Tai, 2008). They argue that the goal is not just *more* content but the *right* content in which deep understanding leading to deep learning is developed.

Depth encourages students to think critically about what they're learning, to gain an understanding of how those ideas and concepts relate to each other. Depth of content knowledge reveals patterns and insights which are important to support deep learning. Depth refers to the amount of detail a student needs to know about a particular topic.

Breadth of knowledge, on the other hand, usually provides the context of the topic being studied/taught, how the topic is interrelated and interconnected with others. Breadth of content knowledge also provides opportunities to receive a well-rounded education that prepares students for employment and for life in general.

To understand the meaning of something, depth is required while to understand the context, breadth is essential. Therefore according to Paek, Ponte, Sigel, Braun, and Powers (2005), teachers who strike an appropriate balance between depth and breadth

of content coverage are more effective in facilitating successful performance by students.

In order to promote deep learning, deep understanding of knowledge is required because competence and ability to learn are correlated with broad knowledge (Hirsch, 2001). In the analytical framework, depth, breadth and relevance of content knowledge, are considered in the analytical framework.

Assessment

Assessment is regarded as a central element in determining the quality of teaching in higher education (Australian Universities Teaching Committee, 2002) as well as an integral component of the student learning experience. In this study, the focus is on classroom assessment, which is among a teacher's most essential educational tools. When properly developed and interpreted, assessments can help teachers better understand what their students are learning.

Stiggins, Arter, Chappuis, and Chappuis (2007) recognises two types of assessments in the classroom – assessment *for* learning and assessment *of* learning. Although teachers use both assessments, it is assessment *for* learning, which provides the day-to-day information which assists student learning. Black and Wiliam (1998) highlight the achievement gains that assessment *for* learning practices seem to bring to all learners. Research on classroom assessments point to the immense benefits they bring to learning (Price, Pierson, & Light) such as:

- High quality teacher-designed assessments provide insight on what and how students are learning in time for teachers to modify or personalise instruction;
- They allow teachers to assess a broader range of skills and abilities in addition to content recall; and
- These assessments give students new roles in the assessment process that can make assessment itself a learning experience and deepen student engagement in content (2011, p. 2).

Assessment *for* learning has major motivational and achievement impact on students(Stiggins et al., 2007). It enables students to take control of their own learning by providing a clear vision of learning.

On the other hand, assessment *of* learning is assessment for purposes of providing evidence of achievement for reporting. The purpose of this kind of assessment is usually summative and is mostly done at the end of a task, or unit of work. In this study the focus is not on summative but formative assessment.

The following indicators selected for assessment further describe and analyse their relevance in the study.

Selects, constructs and utilises appropriate assessment strategies (formative and summative)

To understand the role and function of assessment as a promoter of effective student learning in the context of the analytical framework, the focus in this section is on informal formative assessment which is the most common form of assessment implemented during lessons (Ruiz-Primo & Furtak, 2007, p. 58). Discussion will begin with formative assessment and then move on to informal formative assessment and how it is used to promote learning in the classrooms.

A key argument for teacher-conducted formative assessment is that it should be integrated into everyday teaching and learning activities. Ruiz-Primo (2011, p. 16) asserts that informal formative assessment does not focus on conventional assessment means to collect and interpret information about students but is consistent with the purposes of sound educational assessment; it supports instructional decisions based on inferences made about students.

Bell and Cowie (2001, p. 540) assert that it is a tool teachers can use to probe student understanding, inform instructional decisions, and develop relationships. Teachers can gather, interpret, and act on information about students' learning so that learning may be improved (Bell & Cowie, 2001). Consequently information gained through formative assessment can be used to modify teaching and learning activities in order to reduce the gap between desired student performance and observed student

performance (Bell & Cowie, 2001; Black & Wiliam, 1998; Shavelson, Black, Wiliam, & Coffey, 2003). Capel, Leask, and Turner (2003) assert that formative assessment provides information which can further aid progress, diagnose good reasons for good and bad performance and target particular learning needs.

Classroom formative assessments can be formal or informal. In the formal mode, premeditated assessment is used to make explicit what students know and what they can do (Ruiz-Primo & Furtak, 2007). Typically, formal formative assessments take the form of curriculum-embedded assessments that focus on some specific aspect of learning, but they can also be direct questioning, quizzes, brainstorming, generation of questions, and the like (Bell & Cowie, 2001). The activity enables teachers to step back at key points during instruction, check student understanding, and plan the next steps that they must take to move their students' learning forward. Teachers plan the implementation of this kind of formative assessment at the beginning, during, or at the end of a lesson.

On the other hand, informal formative assessment is more improvisational and can take place in any student–teacher interaction at the whole-class, small-group, or one-on-one level (Ruiz-Primo & Furtak, 2007). It can arise out of any instructional or learning activity at hand, and it is 'embedded and strongly linked to learning and teaching activities' (Bell & Cowie, 2001, p. 86). According to Wragg (2001) informal formative assessment can be intuitive, undertaken on the spur of the moment, random, a response to whatever the topic or theme is at a particular time, and unrecorded.

Strategies of informal formative assessment might include observation, questioning, and feedback (Wragg, 2001). The information gathered during informal formative assessment is transient (Bell & Cowie, 2001) e.g., students' comments, responses, and students' questions, and usually goes unrecorded. The time-frame for interpreting and acting is more immediate when compared with formal formative assessments. Ruiz-Primo and Furtak (2007) noted that a student's incorrect response or unexpected question can trigger an assessment event by making a teacher aware of a student's misunderstanding or otherwise.

Monitoring seatwork during the lesson activity is another example of informal formative assessment. The teacher can ask questions, guide the student(s) as they engage in tasks, clarify matters, and provide instantaneous feedback on students' work while s/he is monitoring the class. They are, therefore, assessments that take place in the course of events, but which are not specified in the curriculum design.

Informal formative assessments can help to slow teaching down, to re-teach or review materials the students did not understand and therefore support student learning more effectively. Formal formative tasks achieve the same purpose but are more structured and premeditated.

Assesses prior knowledge of student learning

In addition to informal assessment, assessment of prior learning has been mentioned above. It is a very important part of teaching and learning (Pratt, 2002). As noted it acts as a lens through which students view and absorb new information Kujawa and Huske (1995). It is a composite of each learner based on what they has been learned from both academic and everyday experiences. According to Kujawa and Huske (1995) prior learning is:

- Attitudes such as beliefs about ourselves as learners, awareness of our individual interests and strengths, and motivation and our desire to learn;
- Experiences such as everyday activities that relate to learning, events in our lives that provide background understanding, and family and community experiences that we bring to school with us; and
- Knowledge of the topic under consideration (Kujawa & Huske, 1995, p. 1).

When teachers link new information to the student's prior knowledge, they activate the student's interest and curiosity, and infuse instruction with a sense of purpose (Moses, 1990). Questions can be used to retrieve prior knowledge, where it will act as a scaffolding to which the students will add new information.

Prior knowledge also forces a theoretical shift to viewing learning as conceptual change (Strike & Posner, 1985; West & Pines, 1985 as cited in Roschelle, 1995). A

conceptual change is the process of transition from ordinary ways of perceiving, directing attention, conceptualising, reasoning, and justifying by which learners gradually transform prior knowledge to accommodate new ideas (Posner, Strike, Hewson, & Gertzog, 1982 as cited in Roschelle, 1995).

To summarise, these two components - informal formative assessment and assessment of prior learning will inform the assessment practices in the case studies.

Resources

An increased need for learning resource materials is implicit in many of the developments in education (Harden & Crosby, 2000) as constructivism takes hold. With student-centred, active and deep learning approaches, students are dependent on access to appropriate resource material available for use either as individuals or in groups.

The term 'resources' has been used to include teaching materials, teaching resources as well as other learning materials as they have in common the ability to support student learning.

Appropriate and variety of resources to enrich learning

Ideally, resources should be tailored to the context in which they are being used, to the students in whose class they are being used, and to the teacher.

Incorporating appropriate teaching materials into classroom teaching can significantly increase student achievement as they have a specific function in student learning Chickering and Gamson (1987). Appropriate resources vary from traditional textbooks to the incorporation of multimedia in lessons, and depend on the nature of the subjects, the requirements of the courses, lessons, and the resources available. More recently the Internet has added a vast array of resources.

Textbooks

Good textbooks are excellent teaching aids and constitute an appropriate resource for both teachers and students and are used in Bhutan. A textbook is a collection of the knowledge, concepts, and principles of a selected topic or course (Fredericks, 2005). One or more teachers, college professors, or education experts who

are authorities in a specific field usually write them. Most textbooks are accompanied by teacher guides, which provide supplemental teaching materials, ideas, and activities for use throughout the academic year. Good textbooks provide a balanced, chronological presentation of information. However, a textbook is, in effect, only as good as the teacher who uses it. Teachers need to make decisions about using textbooks as there is a tendency for some to over-rely on them, and for others reject the textbook approach to learning as it may contain out-dated information or insufficient coverage of the topic or subject area.

Chalk/white boards

The traditional chalkboard can be an effective tool for use in the classroom and is well used in Bhutan. The emergence of new technology such as digital media and other resources such as interactive whiteboards (smart boards) and student laptops has rendered the chalkboard out-dated in some settings. Nonetheless, they are still used in university teaching, especially in countries where technology has not yet gained a stronghold. There are many advantages of using them in classrooms. For example, they improve teaching effectiveness, classroom management and student academic success and in many cases are more reliable than their electronic counterparts (Gray, 2012) especially in developing countries.

PowerPoint Presentations

Increasingly, traditional lectures in higher education are being delivered using presentation software such as Microsoft PowerPoint (Nicholson, 2002). Potential benefits of the use of presentation software can create a more active leaning environment and can increase the effectiveness of classroom interaction (Sammons, 1997 as cited in Nicholson, 2002, p. para. 1). It is a well-known versatile and easy tool to use. It may capture students' attention and keep them interested (Meem, 2012) as it has potential visual appeal that would generate interest. PowerPoint presentations can create variety by using graphics, animation and sound, thus gaining and keeping the students' attention. It can be a powerful tool if used well in the classroom to promote student learning. Creed (1997 as cited in Nicholson Nicholson, 2002, p. para. 1 , see

also Tufte, 2003), counter-argues that PowerPoint is teacher-centred and that in some sense it can be a 'bad pedagogical tool'.

The other disadvantages cited with PowerPoint are unless a good deal of forethought and careful planning are exercised, poorly designed PowerPoints can cause 'cognitive overload' (Ludwig, Daniel, Froman, & Mathie, 2004) amongst other things. Tufte (2003) asserts that it makes complex issues seem more simple and clear-cut than they are. He attributes this to the frequency with which complex ideas are squashed into bulleted lists. Another criticism is the pressure to provide an outline for presentation, which enforces a linear progress progression through the presenter's hierarchy of ideas (Tufte, 2003). PowerPoint is also said to lack spontaneity, as it is a carefully-planned event, usually with a controlled linear timeline and an outcome planned by the teacher (Ludwig et al., 2004). While such planning and control is useful in other fields, such as delivering a sales presentation, too much control and planning can be stifling for teachers.

Use of physical space in the classrooms

Institutions of higher education are charged with fostering specific kinds of learning. Space can have a powerful impact on learning, and according to Chism (2006) cannot be overlooked in the attempts to accomplish goals.

Some research suggests 'less attentive and less successful students are particularly affected by the desk arrangement, with their on-task behaviour increasing very significantly when seated in rows instead of [at] tables' (Higgins, Hall, Wall, Woolner, & McCaughey, 2005, p. 26). Monahan (2002, as cited in Chism, 2006) argued that the ways in which a space is designed shape the learning that happens in that space. A room with rows of tablet armchairs facing an instructor's desk in front of chalkboards conveys the pedagogical approach of lecturers lecturing and students listening, whereas a room of square tables with a chair on each side conveys the importance of teamwork and interaction to learning.

The influence of physical space on human activity has been studied from both psychological and physical perspectives. From a physical viewpoint the effects of light,

temperature, and physical closeness can impact the learning environment in the classroom. Higgins et al. (2005) cite research that links the physical attractiveness and lighting of a space to the motivation and task performance of those in the space, while, Graetz and Goliber (2002 as cited in Chism, 2006) provide a summary of work that links lighting to psychological arousal, overheated spaces to hostility, and density with low student achievement. Scott-Webber (2004 as cited in Chism, 2006) showed that environments that provide experiences, stimulate the senses, encourage the exchange of information, and offer opportunities for rehearsal, feedback, application, and transfer are most likely to support learning.

Teachers as resources

Teachers have a great influence on students and their learning as curriculum planners, implementers and assessors. They also organise the resources and make available additional information and teaching/learning aids for students. Their understanding and knowledge of the curriculum are fundamental to the teaching - learning process. According to Harden and Crosby (2000) good teachers are more than lecturers as they are an important source of knowledge, skills and expertise in their subjects. They are also motivators.

Role of Teacher

Academics have diverse roles. More specifically in the classroom, they facilitate learning. The role of the teacher can be examined based on the findings of a body of research that examined university teachers' conceptions and approaches to teaching over a decade (Åkerlind, 2004; Biggs, 2003; Entwistle, Skinner, & Entwistle, 2000; Kember, 1997; Ramsden, 2003; Trigwell & Prosser, 1997).

Teachers' roles include the following activities i) Imparting information; ii) Transmitting structured knowledge; iii) Directing active learning; iv) Facilitating understanding and v) Encouraging conceptual changes (Entwistle, Skinner, & Entwistle, 2000; Kember, 1997). The indicators 'creates conducive learning environment, encourages students to accept responsibility and accommodates diverse learning needs of all students and demonstrates an understanding and in-depth knowledge of content

and maintains an ability to convey the content to students are built into each role in increasing degrees.

Imparting information

The first role is based on the view of lecturers as presenters of information to the students; this is the most teacher-centred role. These lecturers in these roles view teaching as purely presenting information, and consider the student as a passive recipient of a body of content (Calkins & Light, 2007; Kember, 1997; Trigwell & Prosser, 1997). The focus is upon the lecturer and the knowledge of the lecturer, and a good teacher is considered to be one with sound academic content knowledge. In this role the lecturers do not purposefully encourage students to accept responsibility for their own learning, nor create an environment conducive to learning. Although they demonstrate a good in-depth understanding of content knowledge they lack pedagogical content knowledge (PCK) to effectively create an environment conducive to learning and adeptly use teaching skills and strategies to actively engage students with learning tasks.

Transmitting structured knowledge

The second role also involves presenting of information, but recognises the importance of structuring and arranging that information to maximise students' chances of receiving it (Calkins & Light, 2007; Kember, 1997; Trigwell & Prosser, 1997). In this role, sound academic knowledge is still the most important attribute of a good teacher, but there is now more emphasis on the quality of the presentation which can be viewed as a stage performance (Kember, 1997).

Directing active learning

The third role is as director of active learning (one who values student-teacher interaction) (Kember, 1997). Lecturers in this role want students to examine evidence, but within a body of knowledge and content defined by the lecturer. Here the focus shifts from being almost exclusively on the lecturer's knowledge to recognising the importance of students' learning.

Facilitating understanding

The fourth role is as facilitator of understanding. Kember (1997, p. 268)

describes this role of the lecturer as helping students to learn, in a way that enables them to apply the knowledge rather than regurgitate it. The emphasis is on student learning outcomes rather than upon defining content.

Encouraging conceptual changes

The fifth role involves the teacher *encouraging* conceptual change and focuses on bringing about changes in the students so that they can better understand the subject/lesson topic. It concerns changing the conceptual representations of students in such a way that they can construct meanings for themselves, not only from the class teaching but also from outside the classroom so that it broadens their knowledge as well as be able to apply in situations. Students acquire the ability to ask their own questions (Light & Calkins, 2008).

Evidence shows that teachers' effectiveness plays an important role in making a difference in student learning. A highly qualified teacher is one of the most important factors in raising student achievement (Imig & Imig, 2007). An excellent teacher is one who is a subject matter expert, has pedagogical expertise, an excellent communicator, a student-centred mentor, and a systematic and continual assessor (Hattie, 2003) thus pointing out that all five roles are important for a good teacher to draw from. Academics being teachers are also curriculum/lesson planners, implementers of curriculum/lesson, assessors of students learning and resource developers (Harden & Crosby, 2000). Curriculum planning is an important role for the teacher in which they address the curriculum/lesson needs of the organisation as well as of the learners. In the planning role, the lecturers organise the content, decide the teaching methods, the assessment procedures and management of the learning environment. As implementers they either facilitate or transmit the content, utilising teaching methods – the conventional lecture supporting the transmission mode or interactive activity based approach endorsing the facilitation mode. As an assessor, the lecturer plays an important role in judging students' performance (Harden & Crosby, 2000, p. 12). As an assessor in formative assessment, the lecturers help students improve their learning by proving feedback, and monitoring their work. Additionally, lecturers are the resource material organisers and sometimes creator. The teachers take on either a teacher-centred or student-centred role

while shouldering these important responsibilities as planner, implementer, assessor, and organiser of resources for learning/teaching. They must also possess characteristic features such as patience, cooperation, flexibility, and the ability to relate to learners.

Role of Student

There are significantly more students attending universities than there were twenty years ago and this is certainly the case for Bhutan. More importantly, the composition and characteristics of the student body have changed in a number of ways. Universities aspire to produce graduates who are knowledge users, equipped with problem-solving and critical-thinking skills. Educators are likely, therefore, to strive constantly to find teaching strategies to produce creative and critical thinkers.

A growing body of research into student learning shows an empirical relationship between teachers' approaches to teaching and students' approaches to learning (Åkerlind, 2008; Biggs, 1999; Kember & Gow, 1994; Lindblom-Ylänne, 2008; Tait, 2009; Trigwell, Prosser, & Waterhouse, 1999). According to Åkerlind (2004) students fall into four broad roles: i) passive recipients, ii) responsive recipients, iii) active recipients, and iv) active creators somewhat corresponding to the five roles of teachers identified in the preceding section. The roles show the levels of responsibility student take for their learning ranging from active participation to being a passive recipient.

Passive recipients

Passive recipient students are those intend for the lecturers transmit information or who are forced to take this role by the lecturer simply imparting information (Reis, 2010). Students are passive listeners, demonstrably disengaged from the lesson, as they are not actively involved except perhaps for note taking. The passive nature of the 'traditional lecture' method imposes little stress on the student beyond the necessity of putting him/herself into a quiet receptive state in which they are merely expected to listen and remember (Reis, 2010).

Responsive recipients

Responsive recipients are students who are more active in responding to questions, ask questions, and listen attentively. This could be because the lecturer places emphasis on building positive relationships with the students (Åkerlind, 2004) besides engaging them in knowledge transfer in the classes.

Active recipients

Active recipient students are pro-actively engaged and involved in the lessons. They are more likely to take responsibility for their own learning, ask and answer questions, discuss and analyse information, discover rules, share viewpoints and collaborate with others. Students in this role participate in the activities, think, and reflect on their learning.

Active creators

Active creator students take on a more pro-active role in creating their own learning (Åkerlind, 2004). They usually demonstrate enjoyment in learning and discover new knowledge and understandings for themselves. In this way they experience personal development through their learning in terms of developing greater awareness of how they operate as individuals, and how the subject discipline and /or society operates (Åkerlind, 2004, p. 370).

There are a number of factors that influence why students assume the particular roles that they do. For example, as explained above, in the Bhutanese context, it is a cultural mores that respect and regard be accorded to teachers often expressed through passivity. This is gradually changing with the younger generations of students but remains a powerful cultural force that is difficult to challenge.

In the international context, Oblinger (2003) notes the kinds of students entering universities - the Boomers, Millennials and Gen-Xers. The latter two are greatly influenced by information technology. This, she says, is important as these differences need to be taken into account when designing programmes or courses in universities. The students are very comfortable with technology and use Internet for college, work,

and leisure (Oblinger, 2003). Thus today's college and university students have developed new attitudes and aptitudes as a result of their environment such as requiring immediate answers to questions posed to lecturers on the Internet.

A further factor that influences the roles of students in higher education is the consumerist pattern of thinking that has developed in response to the high costs they have to pay for their education in the UK, Australia, Europe and America (James, 2002). One effect that has been noted is that some students appear to take on a passive role in their learning as they seek greater spoon-feeding and narrowly reproductive approaches to assessment. They are generally more likely to judge the quality of teaching in terms of 'value for money'. There is also a sharpening distinction between 'achievers' and the students who simply wish to do the minimum work to achieve a pass standard, resulting in increasingly bi-modal grade distributions (James, 2002, p. 72). Many students now expect that their studies should be supported very strongly by what takes place in lectures; handouts, readings, and online support. These are seen as being central to the study habits of most students. Few have the time or the inclination to 'read around' their chosen field of study, preferring instead to rely on what they are told or given by lecturers (Celtic Regional and Minority Language Abroad Project, 2006). Furthermore, students in higher education expect to study less and 'get more' from their classes according to James (2002). This 'strategic' approach to teaching and learning means that students want far more 'hand-holding' and expect less self-directed study than the students of ten or twenty years ago. However, such strategic approaches to study often result in 'surface' rather than 'deep' learning Biggs (2003) argues and may mean that key concepts are poorly understood.

Conclusion

The key finding of the studies on conceptions of teaching/learning is a distinction between learning-focused and content-focused approaches to teaching. The learning-focused approach is described as a way of teaching that facilitates the students' learning processes. The content-focused approach is described as a way of teaching in which students are considered to be more or less the passive recipients of information transmitted from the teachers to the students (Entwistle, Skinner, & Entwistle, 2000;

Kember & Kwan, 2000; Prosser et al., 2005; Trigwell, Prosser, Martin, & Ramsden, 2005; Trigwell et al., 1999).

Examination of deep, and surface learning in the preceding sections reveal that they have a significant impact upon the way students approach learning. A third approach – the strategic approach adopted by students seeking to maximize their academic performance, when associated with deep learning, the outcomes can be deep, motivated learning.

To summarise, the seven categories in the analytical framework (see Tables 2.3 and 2.4 above) lead to the derivation of the three research questions on the planning, implementation and evaluation phases in the study and also forecasted the methodology of the study.

The next chapter provides a description of the research design, questions and methods used in the study to investigate the nature of teaching and learning in the Royal University of Bhutan.

Chapter Three: Methodology

Introduction

In the previous chapter, the underlying theoretical framework of this study was discussed. This chapter introduces and explains the research methods and processes used and explored within this study. A pilot study was also justified and conducted and a case made for inclusion of data from it (Appendix 3.9). Finally, the ethical considerations relevant to this research are discussed.

The design and methods of the study were determined primarily by the nature of the research questions, the conceptual and theoretical frameworks, and the research paradigm (Leedy & Ormrod, 2005; Robson, 2002; Rosenthal & Rosnow, 2007; Saunders, Thornhill, & Lewis, 2009; Taylor & Bogdan, 1998). The three research questions identified in Chapter 1, determined the research design, methods, instruments and data analysis. The research questions are:

- *What is the nature of the planning that lecturers engage in as they prepare for their lessons?*
- *How do the lecturers implement their prepared plans in a way to support student learning?*
- *To what extent do the planning and implementation practices of the lecturers support student learning?*

The *Research Learning and Management Matrix* (RL&MM) (Maxwell & Smyth, 2010; Smyth & Maxwell, 2008) was used as a guide throughout the project, providing a framework for monitoring ongoing progress. The RL & MM set out the entire study through the research questions, which provided directions linking methodologies, design, and the practical realities. The RL&MM used a two-dimensional framework allowing flexibility whilst keeping the project focused (Smyth & Maxwell, 2008). The RL&MM of the study provides a comprehensive overview of the research design (see Appendix 3.1).

However it must be mentioned that bearing in mind the overall aim of the study,

an intense study of the different methods and processes were examined from the literature and other studies similar in nature, to consider which one was most suitable for this study. This is because choosing the qualitative or the quantitative strategy, the philosophical stance and the epistemological and ontological perspectives (Lincoln and Guba, 1985) to be used in the research study are most critical to the research process. As emphasized by Guba and Lincoln (1994, p.105), 'questions of method are secondary to questions of paradigms'. These very important issues have to be understood and clarified before the research even commences.

Research Paradigm

Research paradigms offer loose frameworks that steer the research, but more importantly, provide researchers with sensitizing lenses with which to review reflexively 'what we do', 'how' and 'why we do it' (Raven, 2006).

The study is essentially interpretivist which is consistent with the major research questions. It centres on the idea of obtaining a better understanding of the situation through the perceptions of others and observation. The main thrust of the study concerns meaning, and the aim is to uncover the way members of the Colleges in RUB understood and applied planning, implementation and evaluation practices in their classrooms. Interpretivism highlights deep understanding of social events (Woods, 2006). Shah and Corley (2006, p. 1823) explained that interpretivism is based on the belief that a deeper understanding of a phenomenon is only made possible by understanding the interpretations of that phenomenon by those experiencing it. This perspective assumes that reality is constructed by people (including the researcher) who participate in this reality. Constructivists acknowledge that their *interpretation* of the studied phenomenon is in itself a *construction* (Charmaz, 2006, p. 187). Explanations for these assertions are explored along with the philosophical assumptions (Creswell, 1998) in the context of the research situation.

The *ontological assumption* of this study is that reality is constructed. Guba and Lincoln (1989, p. 83) state that the ontological assumptions are those that respond to the question What is there that can be known? and 'What is the nature of reality? In this

study, the reality is the planning, implementation and evaluation practices of the lecturers in the Colleges of RUB. It is thus, the perceptions and the actions of the lecturers and students in the selected Colleges that are examined.

Epistemology is 'a way of understanding and explaining how we know what we know' (Crotty, 2003, p. 3). It has profound implications for the way the information is gathered, the relationship between the researcher and researched and the *credibility, transferability, dependability* and *confirmability* of research (Creswell, 1998). This assumption is manifest in that I am part of the teaching faculty in the RUB, which gave me the advantage of having an insider's view, thus enhancing the personal experience of investigating the participants' opinions and attitudes. As I was familiar with many of the participants, collaboration with them was comfortable, and quality time could be spent in the participants' work situation – namely, the classrooms, and the Colleges.

The work is reported in a literary manner as required by the *rhetorical assumption*, but has a personal voice as an acknowledgement that I was a participant in the phenomena being studied, that choices were made in the course of the research that influenced data collected and reported. My worldview influenced these choices to some extent. Moreover, I had been a member of Samtse College of Education (SCE) staff since 1991 and have been intimately concerned with academic development at SCE since I took up the position of Academic Dean at SCE in 2001. My background as a teacher and teacher educator also assisted me in interpreting the data.

Research Design – Case study

Researchers have used the case study design for many years across a variety of disciplines. Social scientists, in particular, have made extensive use of this design to examine contemporary real-life situations and provide the basis for the application of ideas and extension of methods (George & Bennett, 2005). Case study research consequently excels at bringing an understanding of a complex issue and can extend experience or add strength to what is already known through previous research. Case studies emphasise detailed contextual analysis of a limited number of events or conditions and their relationships (Dooley, 2002, p. 335).

The selected research design encompassed multiple case studies (Stake, 2000) thereby allowing the investigation of the nature of teaching and learning practices in situ. Investigating these led to better understanding, perhaps better theorising, which can lead to further studies (Stake, 2000, p. 435). Stake (2000, p. 436) stressed that the more the object of study is a specific, unique, bounded system, the greater the usefulness of the case study. The choice of the colleges in RUB fulfils these criteria. The design included two stages; a pilot study (Appendix 3.9) followed by the main study.

The case study is designed to explore 'what it is like' to be in a particular situation; to catch the close-up reality and thick description (Greertz, 1973 as cited in Cohen, Manion, & Morrison, 2007, p. 254) thoughts about, and feelings related to a situation.

An inherent characteristic of case studies is their restricted focus. This can be an advantage, as restricting the scope facilitates the construction of detailed, in depth analysis of what is to be studied (Hodkinson & Hodkinson, 2001, p. 2). Furthermore, because of the depth that is possible, case studies can engage with complexity. These characteristics were essential to the research study, to develop an in-depth construction and engagement with the complexity of the nature of teaching and learning in the selected Colleges of RUB.

The case studies explored in this research are 'instrumental', defined by Stake (2005) as 'a particular case [that] is examined mainly to provide insight into an issue … it plays a supportive role and facilitates our understanding of something else' (p. 445). Another purpose of the case study is to go beyond the case (Stake, 2005, p. 8) to understand the 'something else' in this project, the gaps in knowledge and understanding of the planning and implementation practices of the lecturers in the selected Colleges.

Although the case study has some disadvantages, such as limited generalisability and being time-consuming, the advantages offered are considerable. In addition to gaining understanding of the cases, case studies facilitate exploration of the unexpected and unusual as well as the common patterns and categories. These significant issues can

be valuable as they throw light on the nature of more usual processes (Hodkinson & Hodkinson, 2001, p. 4). Case studies provide opportunities for generalisability by the reader (Stake, 1995). In the context of these advantages and pertinent research questions, the case study design was highly relevant.

Use of Multiple Case studies

While one case would be instrumental in providing insight into the issues of the nature of teaching and learning of the lecturers and students at one college/institute, investigation of several cases could be expected to yield more robustness to the findings and thus strength to the conclusions (Yin, 2009). Yin cautions that using single case studies can produce data that is susceptible to misinterpretation. Stake (2005) uses the term 'multiple case study' for a situation in which interest is not necessarily on one particular case, but in a number of cases, such as in this study. According to Stake (2005) adding cases improves the trustworthiness of the outcomes and Yin (2009) asserts that this strategy of using multiple cases and then drawing up a single set of cross-case conclusions is a powerful way of comparing the cases and drawing out the key conclusions.

For the present investigation, the use of multiple case studies is appropriate in order to address the research questions regarding teaching and learning at several colleges at the RUB. For these reasons, and the scale of the study, four independent case studies were conducted in addition to the pilot case study. The cross-case analysis compares and contrasts the findings across the five cases, thus enriching the project findings.

Each case is reported independently which Stake (2005, p. 458) says affords readers the opportunity to 'learn more about it directly from the description'. Each case is intended to be sufficiently detailed for readers to draw their own conclusions as suggested by Van Maanen (1999 as cited in Yin, 2009). Individual case reports are presented in Chapters 4, 5, 6, and 7.

Selection of case study sites

The selection of the sites at which to conduct the case studies was made

according to Patton's idea of 'purposeful sampling' (2002 as cited in Merriam, 2009, p. 77) and driven by a desire to discover, understand, and gain insight into the different and substantive areas of teaching covered by the colleges. Patton (2002, as cited in Merriam, 2009, p. 77) asserts that the 'logic and power of purposeful sampling lies in selecting information-rich cases for study in depth'. Therefore the selection of the cases for the study was largely driven by the nature of the research questions. According to Stake (2005, p. 451) purposive samples should be selected where there is 'some typicality but leaning towards those cases that seem to offer opportunity to learn'. These were the guiding principles on which selection was based in order to discover the richness of information, the diversity, the uniqueness, the history, and the variety of programmes offered in quite different Colleges.

Practical aspects such as the language of instruction in the colleges were also considered. This would have meant considerable additional time in translation as well as the complications that translation would entail and was unlikely to result in distinctively different data.

From a total of ten colleges in the RUB, seven colleges were chosen and data were collected from each. Data collected in the first college visited, Samtse College of Education, constituted the pilot study. Following initial data analysis, two colleges, Royal Institute of Health Sciences and Institute of Language and Cultural Studies, were omitted from the study since it was decided that more detailed (rich) analysis of a fewer colleges would provide a better answer to the research questions than more brief analysis of many. The five colleges included in the final analysis were those that broadly represented the goals and practice of RUB.

Sherubtse College (SC) had a history of affiliation with the University of Delhi (DU) (since 1983) and had offered courses conferred under the legislation of DU till 2006 (and some courses are still in the process of being phased out). As one of the largest and oldest colleges in the country with student strength of 1075 and staff of 102 (Sherubtse College, 2010), it also offered a wide variety of programmes ranging from Dzongkha Honours to Computer Science BSc degrees. Therefore it represented an

exciting and challenging college to investigate.

The *College of Science and Technology* (CST) was the second site to be chosen, as it was the only college in Bhutan offering degree courses in engineering and technology. It presented a challenge to find out how engineers and technicians were taught and because it was scientifically oriented, it was relevant to find out whether the teaching and learning practices differed from those in other colleges.

The *College of Natural Resources* (CNR) was chosen because it was one of the most richly-resourced colleges in RUB, and had the largest number of faculty members holding doctorate degrees. Like CST it presented a scenario for teaching and learning practices in the technical field.

Finally, the *Paro College of Education* (PCE) was chosen. The pilot had been conducted in the other College of Education and Paro College offered opportunity for comparison between colleges offering similar programs, thus enabling discovery of patterns of consistency and differences in the planning, implementation and evaluation practices of lecturers in the two education colleges.

Strategies of Inquiry: Using mixed methods

The study adopted a mixed-method strategy (Tashakkori & Teddlie, 2003), mainly using qualitative methods, but with a small component of quantitative data. Using such a strategy provided the best way to answer the research questions as it provides the advantage of using multiple ways to explore a research problem. The use of some quantitative processes together with several qualitative strategies also offered the potential for triangulation of data sources (Creswell, 2003). Descriptive statistics was used to show the minimum and maximum scores and range of data in the study.

The following sections provide information about data-gathering methods, including the instruments used in both the pilot study and the final project. The discussion on each of the methods begins with the rationale for using the method, followed by the procedure on how it was used in the study.

Observation

Observation was the primary data-collection method in the study. It allowed direct visual contact with the lecturers and students in their natural settings i.e. the classrooms. This method provides the observer with opportunities to see the entire context, and thus appreciate aspects of the situations being studied that are unlikely to be captured using other data-collection techniques. There are numerous research scholars for example (Cohen et al., 2007, p. 396; Robson, 2002, p. 310) who assert the benefits of observation over self-reporting. In naturalistic observation, observers neither manipulate nor stimulate the behaviour of those they are observing, and the situation being observed is not contrived for research purposes (Cohen et al., 2007; Punch, 2005, p. 179).

Several other factors influenced the choice of observation as method. As a detached observer it is possible to notice matters that have become routine to the participants themselves and which they would therefore be unlikely to report but which contribute to an overall picture of the context. The use of the immediate awareness, or direct cognition, as a principle mode of research thus has the potential to yield more valid or authentic data than would otherwise be the case (Cohen et al., 2007, p. 396). Observations also help to triangulate emerging findings; i.e. they can be used in conjunction with interviewing and document analysis to substantiate the findings (Merriam, 2009, p. 11). Observational data are sensitive to contexts and demonstrate strong ecological validity Moyles (2002 as cited in Cohen et al., 2007, p. 396).

My background includes about twenty years experience as a teacher and teacher educator, which afforded me considerable familiarity with the classroom setting and experience in interpreting the planning, implementation and evaluation practices of the lecturers. On the other hand, there is a possible downside to my experience and familiarity with the settings that I was observing. According to Woods (2006) there is the possibility of ‘going native’, which he described as an over-identification with people's views so that one's perspective as a researcher is submerged beneath them. This was possible as I was part of the university and familiar with the participants. Woods’ advice is to maintain ‘analytic distance’ by keeping personal notes/journal. I remained

aware of the risk of losing perspective and worked to maintain my distance, and kept field notes, against such a possibility.

Observations also carry the risk of bias as described by numerous researchers (e.g. Robson, 2002, p. 324; Wilkinson & Birmingham, 2003 p. 228) such as selective attention of the observer, inadequate attention, reactivity, selective data entry, selective memory, and expectancy effects. I maintained my awareness of these risks, particularly in relation to *expectancy effects* and *reactivity*. In relation to the former, I acknowledge what expectancy effects may have influenced me, but in a positive way: I used my experience to focus on important issues as they occurred while continuing to be aware of the possibility of other factors and to record them as appropriate.

The lecturers and students were made aware that their behaviours would be and were being observed. This was a potential problem as the behaviour being observed may not be representative of their normal behaviour. This possibility was taken into account during analysis of the behaviour. Additionally, it may be that what has been observed was the "exception" rather than the rule, that is, some classes may have differed in style or content as they teachers were advised well beforehand that they were to be observed. Apart from maintaining awareness of the possibility that the behaviour I observed might be atypical, thorough cross checking with student interviews and the in-lesson questionnaire was designed to mitigate the problem as far as possible.

Selections of lesson observations

Access to the lessons for observation was dependent on the Deans of the selected colleges and then on the individual lecturers. First the Deans (Academic Affairs) were provided a schedule and brief on requirements of the study and they selected the participants. Second, having been directed to certain participants, those participants were also provided with the same briefing and schedule. The participants then decided which lessons the researcher was to observe. This procedure may have introduced some bias into the sampling population as they may have been selected on grounds other than the rigors of the study's purpose. For example, in PCE access was provided to B.Ed Primary classes only, even though B.Ed Secondary classes are also

taught which did not allow access to either a range of lessons across programmes, or to the range of programmes offered by Paro College.

Lesson observation instrument

The lessons observations were recorded using a simple chart, adapted from the lesson observation chart used in Samtse College of Education for the students during teaching practice (Table 3. 1). The chart has two parts; in the first the setting of the lesson is recorded and in the second the observation procedure (Anderson & Burns, 1989).

The chart was intentionally kept simple and loosely structured as it allowed for flexibility during observations.

Table 3.1. Lesson Observation Chart

College:	Lecturer:
Observer:	Date:
Time:	Subject:
Topic:	No. of Students:
Proposed learning outcomes:	

Time	Teacher activity	Student activity	Comment

The lesson observation sessions required constant vigilance in order to be able to record as many relevant classroom events and interactions as possible. The physical position, namely in one corner, often back of the room, made it difficult to perceive all that was taking place in the class, particularly among the students but this position was necessary in order to remain unobtrusive. Large class sizes in some colleges presented specific challenges such as being able to capture the finer nuances of the lesson, as there were too many people and happenings to observe. Some non-verbal cues like facial expressions which would have indicated students' level of engagement or disengagement with the lessons, were therefore unavailable to me at times. In an

attempt to compensate for any related deficit in information, periods during which lecturers were engaged in physical activities related to their teaching (such as writing on the board or operating the LCD or OHT), and during their pauses, were used to observe the student closely. An *In-Lesson Questionnaires* were given to the students (see below), the rationale being to verify and triangulate the findings of the lesson observations.

Interviews

The interview is not an ordinary, everyday conversation (Dyer, 1995, as cited in Cohen et al., 2007, p. 349). It has a specific purpose; it is often question-based, with questions being asked by the interviewer and is a constructed situation which the researcher has to set up (Cohen et al., 2007, p. 349). DeMarrais (2004, as cited in Merriam, 2009, p. 87) defines "interview" as 'a process in which a researcher and participant engage in a conversation focused on questions related to the research study'. It is a good way of assessing people's perceptions, meanings, definitions of situations, and constructions of reality (Punch, 2005, p. 167) and allows for more detailed questions to be asked (probes). Respondents' own words are recorded, others do not influence them, and ambiguities can also be clarified. They are also time- consuming, as they require setting up, time for the interview process, transcribing, analysing, and reporting. Interviews also have potential problems such as the interviewee telling the interviewer what the former thinks that the latter wants to hear.

Semi-structured interviews were used in the study Interviews were used at two stages in the study. In the beginning of the data collection process, informal interviews – pre-and post-conference interviews (Table 3.2) were conducted with the lecturers whose lessons were observed. In the pre-conference interviews information related to what they were going to teach (content and the learning outcomes) and how they planned to teach it were discussed informally with the lecturers. The pre-conference interview was also a way of meeting the lecturer and breaking the ice before the lesson observation. Copies of lesson plans were also requested at this time. The purpose of the lesson observations was explained to the participants (lecturers). The post-conference interviews were conducted in order to clarify as necessary and seek further relevant

information from the lecturers. Even though the pre and post-conference interviews were brief, they were rich sources of data.

The second set of interviews were mainly utilised to gather additional, beneficial data to support the data in the lesson observations, questionnaires, and field journal (Appendix 3.3). A total of 15 students, 10 lecturers, and 15 academic support staff were interviewed in the selected colleges. They were selected by the Deans in the Colleges based on the requirements intimated to them prior the data collection. The interviews were semi-structured according to Bogdan and Biklin's (1992) model as they were used as a flexible guide to explore issues (Merriam, 2009) related to the research study. They were conducted to collect additional information on teaching and learning and the availability of resources from students, lecturers and academic support staff. Interviews were guided by an interview schedule (Appendix 3.3) developed by the researcher from the research questions and from the researcher's professional experience of teaching and learning in higher education. The interviews contributed to the triangulation of the data.

Interviews have an ethical dimension; 'they concern interpersonal interaction and produce information about the human condition' (Cohen et al., 2007, p. 382). I was mindful of the ethical considerations of confidentiality, informed consent and the consequences of the interviews (Cohen et al., 2007) and ensured that consent was given by the participants and that they were aware of the intent of the interview, their anonymity and that they could withdraw at any time.

Questionnaires

The field of 'questionnaire design is vast' (Cohen et al., 2007, p. 317) as it is a widely-used and useful instrument for collecting survey information, providing structured, often numerical data, is able to be administered without the presence of the researcher, and is often comparatively straightforward (Wilson & McLean, 1994 as cited in Cohen et al., 2007). The responses were gathered through questionnaires are carried out in a standardised way, and information from a large portion of the group can be collected within a short time. Questionnaires are, however, not among the most prominent methods in qualitative research, because they commonly require subjects to

respond to a stimulus, and thus they are not acting naturally (Woods, 2006).

In the study, questionnaires were used to support the lesson observation records as well as to collect students' feedback/perspectives regarding what they experienced in the lessons, hence the label *In-Lesson Questionnaire* (Appendix 3.4). The *In-Lesson Questionnaire* was structured as described by Cohen et al. (2007) around closed questions which limited the range of responses from which the students could choose. The structured nature of the questions made it possible to quantify the data. There were opportunities for open questions too, in the form of '*any other comments'* in which the students were requested to confine the comments to the lesson and not on other issues. Significantly rich data was collected, and later analysed using this question, (Appendix 3.4). Moreover, they were administered immediately at the close of the particular lesson so that the students would provide information on the lessons as experienced. The *In-lesson Questionnaire* was intentionally designed to correlate with the proceedings in the lesson observations so that students could comment on the typicality of the lessons and also provide additional information about the lecturer's style of teaching. The question on typicality was included to ascertain whether the lessons would be the usual lesson or the 'best possible' lesson organised for observation. A carefully crafted lesson designed to impress the researcher, but not what was usually practised would inform the researcher that the lessons were not the usual practices.

Upon collection of the questionnaires, data were complied without delay and a time set to meet some of the students from each class in order to verify and clarify the responses before leaving the data collection site. This was a useful exercise, advantageous in promoting the trustworthiness of the data in the *In-Lesson Questionnaires,* although a time-consuming one.

The original design of the *In-Lesson Questionnaire* (see Appendix 3.5 for a sample copy of original *In-Lesson Questionnaire*) was a little different from the one used in the principal study. More details were added such as planning and organising teaching, communication skills, class interaction, professional knowledge, and professional attitude for the student to comment as a result of the pilot study.

Field Notes

Field notes were maintained throughout the research. This activity facilitated the research process described by Newbury (2001) in which recording observations, thoughts, and questions as they happened were used later. They also stimulated reflective thinking about the research.

Record-keeping in the form of field notes taken during data collection is a critical tool for case study researchers. The notes contain a narrative of daily observations in the field, and add up to a detailed history of the research as it unfolds. Field notes constitute detailed accounts of what occurred, and the researcher records descriptions of what was heard, observed, experienced, and thought in the course of collecting, or reflecting on data in the case study. These notes supplement other data by recording the physical and verbal communication in an observed interaction (Morse & Field, 1996, p. 91). They also provide a context for reflection on the research, and a record of the problems encountered.

However the field notes that emerge from participant observations may be subjective, biased, impressionistic, idiosyncratic, and lacking in precision (Cohen et al., 2007). The possibility of such biases in this project is acknowledged so while making notes I tried to maintain 'analytic distance' by being as objective as possible, and by keeping the research questions in mind so that they would guide me to stay focussed. The field notes in this study turned out to be a gold-mine as they recorded a great deal of significant and critical information, which was not collected any other way.

Document Collection

Collecting documents is non-intrusive. Information that was previously collected, or secondary data, is reviewed to gain a better understanding into the study. This information is part of the organisation's history and can be a valuable key to understanding it.

Information about the colleges, curriculum materials, copies of the *Annual* and *Strategic Reports* of the RUB, and the *Wheel of Academic Law* were made available. As the Colleges had websites, programme-related documents and other College-related

information were accessed. Documents such as the lesson plans, where available, and the module descriptors on which the lessons were based, were collected from the respective lecturers. College administration personnel provided staff profiles, which included details of qualifications, and descriptions of the composition of subject departments. The documents contributed to the overall, as well as specific analyses of the research study.

Data Collection Procedures

This section sets out the practical methods of gathering and recording data. Before any data collection visits took place, permission was sought from the Directors of the selected Colleges to visit the campuses. They were also provided with relevant information regarding the rationale of the research and the data collection details for their information and perusal. On obtaining approval for data collection, as explained in an earlier section (page 83), I was directed to contact the Deans of Academic Affairs for assistance. A schedule was drawn up, taking into account factors such as the academic calendar of the Colleges, the physical challenge of their geographical distribution, and distances. All this entailed meticulous planning, which was carried out in stages, based on the case studies. This had the advantage of providing some 'reflection' time between the cases, but also created 'interruptions' in the process making it necessary to 'switch on and off', a state of affairs that continued until the full time period of cross case analysis and writing. Table 3.2 shows the phases and specific methods used to collect data in each case study.

Data gathering around observations was organised and recorded logically and systematically in six phases – the pre-conference interviews, followed by the observation and then the post-conference interviews after the observation. Pre and post-conference interviews formed an intrinsic part of the lesson observation as the interviews took place in close proximity of both time and place to the observations. These were informal interviews, details of which are included in the interview discussion section. The remaining three phases were interviews with students, lecturers and academic support staff, collection of relevant documents and maintenance of field notes to augment the data collection.

Table 3.2. Phases and Methods for Data Collection

Phases	Methods
1	Pre-conference interviews - *15-20 minutes* Meet the lecturers, whose lessons were to be observed and discuss the lessons they were to teach, ask for lesson plans
2	Lesson Observations -*1 hour* • Use a lesson Observation chart to record the lessons • Explain the purpose of the lesson observation together with the ethics letter to students • Collect the consent forms • Distribute *In-Lesson Questionnaire* to students at the end of the lesson.
3	Post-conference interviews *15-20 minutes* • Briefly meet the lecturers to clarify any doubts about the lessons and seek further information if necessary • Collect *In-Lesson Questionnaires* from students
4	Interviews with students, lecturers and academic support staff on teaching-learning, assessment and resources
5	Document Collection of Module descriptors, College Annual Reports and College statistics
6	Field Notes on the events of each day as well as additional relevant issues

With the support and cooperation of the Colleges, the data collection procedures were successful. The schedule (Appendix 3.6) shows a sample of the planning and data collection in Sherubtse College to demonstrate the process for each data collection visit.

Data Analysis Procedures

A key feature of qualitative research is the simultaneous collection and analysis of data (Merriam, 2009) using a process known as constant comparative analysis. In this process, data is transcribed and examined for content immediately following data collection. Ideas that emerge from the analysis are included in data collection when the researcher next enters the field.

While the data collection was challenging and exciting, the process was not an end in itself. The real challenge was in making sense of the data, by identifying categories and significant patterns and constructing a framework for communicating the essence of what the data revealed. According to Miles and Huberman (1984) qualitative data analyses have few agreed-on canons, in the sense of shared ground rules for drawing conclusions and verifying sturdiness.

Use of thematic analysis

The theoretical base of the study described in Chapter Two and summarised in Tables 2.3.and 2.4 was used to analyse the data. The analysis of the individual cases was followed by a cross-case analysis but in both analyses the same theoretical framework was employed.

The data gathered were compiled, structured, and carefully ordered in preparation for analysis. As much of the data was textual, it required 'thinking' which was why software programmes such as Leximancer (Queensland University of Technology, 2006) and NVivo (Richards, 2005) were not utilised and also because neither of these suited my way of data analysis. According to Patton (2002) the most common sources of qualitative data include *interviews*, *observations*, and *documents* none of which can be 'crunched' easily using software. Manual analysis of the data was most appropriate as the data was 'thick' with descriptions, and required thinking through to make meaning out of them by examining the content of the texts. The description of people's lived experiences, events, or situations needed to be 'thick' (Denzin, & Lincoln, 2000; Denzin, 1989) meaning attention is given to rich detail, meaningful social and historical contexts, and experiences being studied. Therefore, thematic analysis was the appropriate technique to employ in order to analyse the data.

Thematic analysis was considered a suitable technique because patterns in the date were identifiable and themes were categorisable in the way described by others (e.g. Aronson, 1994; Gibson & Brown, 2009; Tere, 2006). However, qualitative thematic analysis looks for insights in which 'situations, settings, styles, images, meanings, and nuances are key topics' (Altheide, 1987, as cited in Merriam, 2009, p.

205) and so goes well beyond the mere counting of words and phrases (content analysis). In this study, thematic analysis was used to examine the concepts, phrases, words, and paragraphs in the questionnaires, interviews, and observations records to tease out rich meaningful answers from them. It was an essential part of evaluating the findings from the planning, implementation and evaluation practices in the Colleges. Similarly, data collected through the field notes was explored using thematic analysis in order to identify and examine underlying meanings in relation to the three research questions.

Following a similar framework to Tesch (1990), the data analysis process in qualitative research was interactive, as soon as the first pieces of data were collected, I began the process of analysing them. As explained by Frechtling and Sharp (1997) part of what distinguishes qualitative analyses from others is a loop-like pattern of multiple rounds of revisiting the data as additional questions emerge, new connections are unearthed, and more complex formulations develop along with a deepening understanding of the material. This process was initially decontextualizing followed by recontextualisation in order to produce a larger combined picture (Tesch, 1990).

There are three aims of thematic analysis within each case and across the cases:

i) Examining commonality – This typically involves finding ways to pool all the examples from across the data set that can be categorised into an example. The commonalities are then subjected to further analysis and subdivision.

ii) Examining differences – the aim here is to find and analyse the peculiarities and contrasts within a given data set, and to examine their potential relevance for the specific topic being explored.

iii) Examining relationships – This may mean looking at ways in which different code categories relate to each other, or how particular individual characteristics or differences relate to general themes (Gibson & Brown, 2009, pp. 128-129).

Identifying themes

A theme is a generalised and decontextualised category of contextually specific aspects of social life that becomes treated as 'of a generalised type' in order to compare

them with other instances of data that were labelled in the same ways (Van Manen, 1998, as cited in Gibson & Brown, 2009). Themes can also be of value in creating new readings and renderings of that data, uncovering emerging categories, patterns, concepts, insights, and understandings (Patton, 2002). However, as advised by Bazeley (2009, p. 5), the analyses have not taken the 'garden path analysis' route, rather a more coherent model was used to 'describe, compare and relate' in relation to the case studies. The planning, implementation and evaluation practices of each case study were described on the basis of data from the *Lesson Observations*, *In-Lesson Questionnaires*, *Interviews* and *Field notes*. They were then compared with and related to the literature on such practices, and an evaluation of the extent to which the practices of lecturers supported student learning in each case study was made. Table 3. 3 illustrates the analytical framework, and shows data analysis in the three phases of the lecturers' practices, and the researcher's evaluation of the three phases. Two levels of evaluation were made. The first relates to the evaluation techniques used by the lecturers during their lesson teaching. This evaluation includes the implementation phase because both teaching and assessment learning occurred during the lessons. The second level is the researcher's evaluation, of the planning, implementation and evaluation practices of the lecturers as observed in the lessons. Details of the analytical framework are discussed in Chapter Two.

Table 3.3. Phases of the analysis process

	Phases in Lessons			
Lecturers' practices	Planning	Implementation	Evaluation	Researcher's Evaluation
Researcher's Observations	Planning	Implementation	Evaluation	

A cross-case analytical framework was also employed in a similar fashion as the within case analysis in order to examine, identify, and highlight patterns of similarities and differences, and what was exceptional in the planning, implementation, and

assessment practices. The evaluation sections of the case studies, which focus on the extent to which the planning and implementation supported student learning, form the core of the discussion. Analysis is presented using the same seven categories as were used in the case study analysis. Additionally, the cross case analysis was used to provide further insights into the different settings of the Colleges and show how the interplay of factors such as resources in the colleges impacted on the teaching and learning approaches in each College. The evaluative analysis was also compared with the relevant literature identified in Chapter Three to find out practices supporting student learning elsewhere.

Assuring Quality: Trustworthiness

Establishing the trustworthiness of interpretivist research is critical. Alan Reid and Gough (2000) recommend that the *credibility, transferability, dependability and confirmability* of research must be considered in qualitative research studies. In this study, as I was the 'instrument' of data collection and analysis and there were multiple realities in this research, it was essential to establish credibility. The trustworthiness of the study was assured using the strategies detailed below:

Credibility involves whether or not the research findings represent a trustworthy conceptual interpretation of the data drawn from the original data (Lincoln & Guba, 1985). Adoption of appropriate methods assists in ensuring credibility, such as purposive sampling, declaration of researcher's subjectivity and triangulation of data and methods is required and implemented. Triangulation serves as a powerful tool to strengthen credibility. The use of *Lesson Observations, In-Lesson Questionnaires, Interviews*, and the *Field Notes* contributed to the triangulation of data. Additionally in the study, in order to validate and clarify students' responses in the *In-Lesson Questionnaires*, I sought clarification in the informal interviews with students.

Transferability is the degree to which the findings of the study can apply or transfer beyond the bounds of the research (Merriam, 2009). This research is bounded by the contexts of the cases and its own time. In this study thick descriptions, as described by Lincoln and Guba (1985), were used. This allows the reader, rather than

the writer, to make generalisations. The reader reads the thick descriptions and draws conclusions relevant to their own situations (Stake, 2000).

In addressing the *dependability* issue, the processes within the study should be reported in detail, thereby enabling a future researcher to repeat the work, even if not necessarily to gain the same results (Shenton, 2004). Such an in-depth approach, as is the case in this chapter, also allows the readers to assess the extent to which proper research practices have been followed. In the study the dependability issue is addressed by minimising the idiosyncrasies of interpretation, and by maintaining consistency in the interpretation of phenomena. My role was explained to the participants and triangulation of data maintained. In the pilot study, I ensured that methods and instruments were tried and tested before the main study began.

Finally, *confirmability* is a measure of how well the inquiry's findings are supported by the data collected (Lincoln & Guba, 1985). It is the qualitative researcher's concern that is comparable to objectivity in qualitative research (Shenton, 2004). Measures to record verbatim what was said, and to accurately record what was *seen* as scrupulously as possible ensured that the findings were appropriate interpretations of experiences and ideas of the informants rather than the characteristics and preferences of the researcher. Again triangulation of data gathering and analysis was done in order to ensure *confirmability.* Open reporting of the researcher's interests and the procedures followed such as documentation of procedures used in the data analysis, collection, processing, compilation and drawing of conclusions also contributed to confirmability of the study, as did completion of a pilot and multiple case studies.

Ethics

Research into any aspect relating to people is problematic, because, apart from involving personal issues, social science research involves moral issues (Eckermann, 2006, p. 49). The researcher, then, potentially has power over people she is researching. This study was conducted under UNE's Human Research Ethics committee ethical requirements.

Data were collected in accordance with the guidelines provided by, and with approval from, the University of New England Human Research Ethics Committee. Approval numbers are HE08/005 (from 28/04/2008 valid to 28/04/2009 for the pilot study) and HE09/143 (from 08/10/2009 valid to: 08/10/2010 for the present study). Approval was also sought from the Research and External Relation Department, RUB for the research data collection. Copies of the relevant documents are provided in Appendix 3.7.

All the participants in the five Colleges of RUB were given written letters of invitation to take part in the research (Appendix 3.8). As mentioned above, the Directors of the Colleges were informed in advance in writing, and permission was received in each case to conduct the research. Written consent was obtained from each participant involved in the research. All the documents were kept in locked cabinets at the researcher's workplace and will eventually be destroyed. Additionally, a colleague in accordance with the UNE Ethics Committee's requirement led the focus group discussion in the pilot study.

As explained earlier, I ensured that the participants were made aware of the purpose of the data collection, and obtained informed consent from them. It was made clear to the participants that they were free to complete the questionnaires or participate in the lesson observations and interviews and that they had the right to withdraw if they wished. The participants were guaranteed confidentiality, anonymity, and non-traceability in this research, according to the guidelines described by Cohen et al. (2007). Complete details regarding the research study were provided to the participants as 'Information to participants' before the data collection (Appendix 3.8).

Although the anonymity of all participants was maintained, identity of the Colleges could not be hidden as the data necessarily reveals and showcases the characteristics of the Colleges. This is the reason that each case study has been identified by the College's name and necessitated the exclusion of some data from the analysis in order to protect the rights of the informants. Because the RUB is a small university and people are well known to each other, the identity of the lecturers is also easily recognisable. Nevertheless all possible steps were taken to disguise the identities

of the participants in the study.

The following section describes the pilot study and explains the significance and outcomes of undertaking a pilot prior to the principal study.

Pilot Study

Van Teijlingen and Hundley (2001) describe pilot studies as a crucial element of a good study design. Such a study was conducted as this increased the trustworthiness of this study as it enabled me to do preliminary testing of the research questions and the instruments. It helped to test the data collection and analysis methods described above and hence strengthen the design of the investigation (Prescott & Soeker, 1999 as cited in Beebe, 2007). The results of the pilot study are reported in Appendix 3.9 and also in the *IJTLHE*. Samtse College of Education was chosen for this pilot for reasons of accessibility since I was employed at that College. The pilot study was conducted in 2008, and followed the procedures set out above. Participants were academic staff (n=8), students (n=222), and administrators (n=5).

There were several practical and theoretical outcomes of the pilot study. While in the pilot study, lessons were videotaped this was not carried in the main study as it was difficult to find professionals to record the lessons. This was disadvantageous for the lesson observations as the critical eye of the camera was an essential tool in gathering accurate visual information. It 'can capture the huge range of non-verbal communication that takes place within every classroom' (Peachey, 2008, p. 1), which may be missed by the human eye but it was felt that adequate data could be obtained by the methods employed in the principal study.

The *Student In-Lesson Questionnaires* were improved, with more questions added after the pilot, in order to access greater feedback than was available in the pilot. As the students in the Colleges were not familiar with the pedagogical language such as planning and organising teaching, class interaction, classroom management, extra time was requested at the end of each lesson to provide a clear briefing on the questions in the questionnaire. As the *In-Lesson Questionnaires* were compiled on-site following the lesson observations, informal discussion was conducted with the students in order to

clarify student responses that were not clear.

Additionally, the analytical framework using teacher and learner-centredness presented some difficulties, as the analytical frameworks were based on a more philosophical than a pragmatic framework. The literature of the pilot study suggested widening of the literature base to include other contemporary and current discourses on teaching and learning in HE at the international level. The pilot study has, therefore, been very useful in providing training in research as well as identifying potential practical, as well as theoretical challenges to the study.

The lessons learned from conducting the pilot study have been a good investment of effort as they highlighted the conceptual difficulties in the instruments and the analytical framework. Beebe (2007) has pointed out that conducting a pilot study can help develop data collection and analysis plans, and gain experience with participants – all benefits that accrued to this project as the result of conducting the pilot.

The pilot study is presented in the dissertation as Appendix 3.9. Some re-analysis of the process and findings were required to make it suitable for inclusion as a case (as compared with the published version). This was because the quantity and quality of the pilot data qualifies it to be included for the cross-case analysis in the penultimate chapter. The frames of reference for the literature and the methods in the pilot were slightly different to those of the main study.

Conclusion

This chapter has discussed the paradigm of this research, described and justified the choice of design and methods for data gathering, analysis, and reporting. It has also provided details of the pilot study, the researcher's role, and particular factors that impinge on the research situation have been discussed as well as ways in which potential negative effects were minimised. Quality control was exercised and ethical processes followed. The next four chapters will examine the four case studies as individual reports, of which Sherubtse College is the first of these studies to be presented.

Chapter Four: Sherubtse College - the Peak of Learning

Introduction

> *His Majesty the Third King Jigme Dorji Wangchuck envisioned that the students in Bhutan should catch up with the scientific and technological developments in other parts of the world. The younger generation must acquire knowledge and work hard if it is to preserve the country's freedom and national heritage* ((Sherubtse College, 2009, p. 1).

A suitable site for a school to live up to this vision was identified in the eastern part of the country. The location is 580 kilometres south east of Thimphu (the capital city) through high mountain passes and low valleys. At the end of this journey the road snakes its way up a 1870 m ridge, at the top of which lies an imposing gate that signals the entrance to the largest and one of the oldest colleges of the Royal University of Bhutan (RUB), Sherubtse College. Behind the trees lies the campus with its concrete structures rising amidst the natural flora, a sprawling lush green campus with an authentic rural flavour. Sherubtse (which means *Peak of Learning)* College was fittingly named and is legacy of the late visionary King Jigme Dorji Wangchuk to the people of Bhutan (Sherubtse College, 2009). It stands impressively on a flat ridge overlooking the paddy fields and deep valleys below and is only 10 minutes drive from the new Yongphula airport. It has been Bhutan's premier college since 1968 when it was built.

The history of Sherubtse College is one of progressive change. It began as a public school with a Jesuit priest from Canada, Father William Mackey, as Principal. In 1976 it was upgraded to a Junior College with pre-university courses in Science. Two years later the Arts and Business programmes were launched. In 1983 it became the country's first college offering degree courses affiliated to the University of Delhi, India. Twenty years later in 2003, Sherubtse became a constituent member of the Royal University of Bhutan. As recently as 2006, the College started offering programmes under RUB.

The College prides itself for its premier status and the fact that education there is the most coveted in the country, on account of the wide range of degree

courses offered. Ever since its inception, Sherubtse College has developed innovative practices in education and social service in Bhutan (Sherubtse College, 2006). The College continues to live the vision that was laid at its foundation in 1968, with many graduates from the College providing on-going significant human resources for Bhutan.

The College's vision is to be an *Institution of higher learning in Gross National Happiness infused liberal arts and sciences, and research for human development* (Sherubtse College, 2010, p. 1). With a view to realisation of this vision, Sherubtse has expanded and diversified its programmes over the years, resulting in a wide range of multidisciplinary programmes in areas of Computer Science, Physical Science, Life Science, Dzongkha, English, Geography, Environmental Science, Economics, Sociology, Political Science, Mathematics, and Population and Development Studies. The college currently (2010) offers ten undergraduate and one postgraduate programmes: B.SC Computer Science, B.Sc Physical Science, B.Sc Life Science, B.A Dzongkha, B.A English, B.A History, B.A. Economics, B.A. Political Science, B.A. Sociology, B.A. Geography, and Postgraduate Diploma Programme in English (Sherubtse College, 2010). The college will soon introduce Master's programmes in English studies, Economics and Mathematics.

From an initial enrolment of 30 students when it offered its first degree awards in 1983, the College has grown significantly over the years, with an enrolment of 1053 students in 2010. Students enrolled in the programmes are successful Class XII students who performed well academically specific subjects and Dzongkha (Sherubtse College, 2010). As part of an ongoing collaboration between the University of New Brunswick, Canada, and the Royal University of Bhutan, particularly between Sherubtse College and Renaissance College, UNB, student interns from Renaissance College, come every year (since 2009) to Sherubtse College for a Leadership Studies internship where they attend classes along with Bhutanese students and work on joint study projects for a period of ten weeks (Royal University of Bhutan, 2011a).

A total of 102 academic staff teach the programmes: 68 of these are Bhutanese and 34 have international backgrounds. The impressive College staff profile is shown in Figure 4.1. A respectable 12 % hold doctoral degrees, 54 % have master's degrees and 33 % have bachelor's degrees.

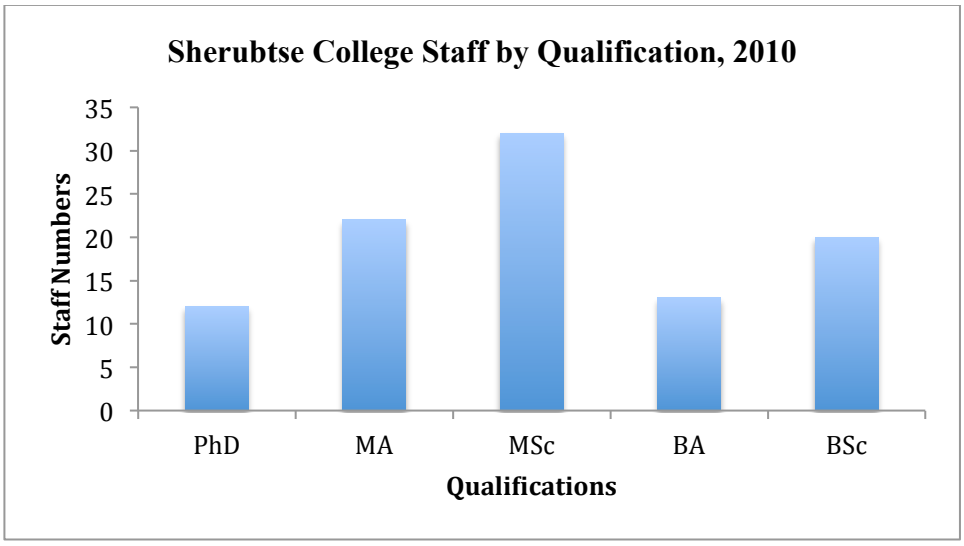

Figure 4.1. – Sherubtse College Staff by Qualification, 2010 (RUB, 2011)

Figure 4.2 shows an uneven spread of lecturers across the subject Departments. The number of lecturers in the Computer Science and Mathematics Department is high compared with those in other departments because two subject faculties have been combined. The English Department has a high number of teaching staff, while departments like Sociology, Political Science and Environmental Studies have low numbers because they have only recently been established. The experience of the staff ranges from forty years to two to three years, of which 60 % are in the latter category (Sherubtse College, 2010). In this respect, the majority of College staff does not bring the same degree of experience to the classroom as do some of their senior colleagues.

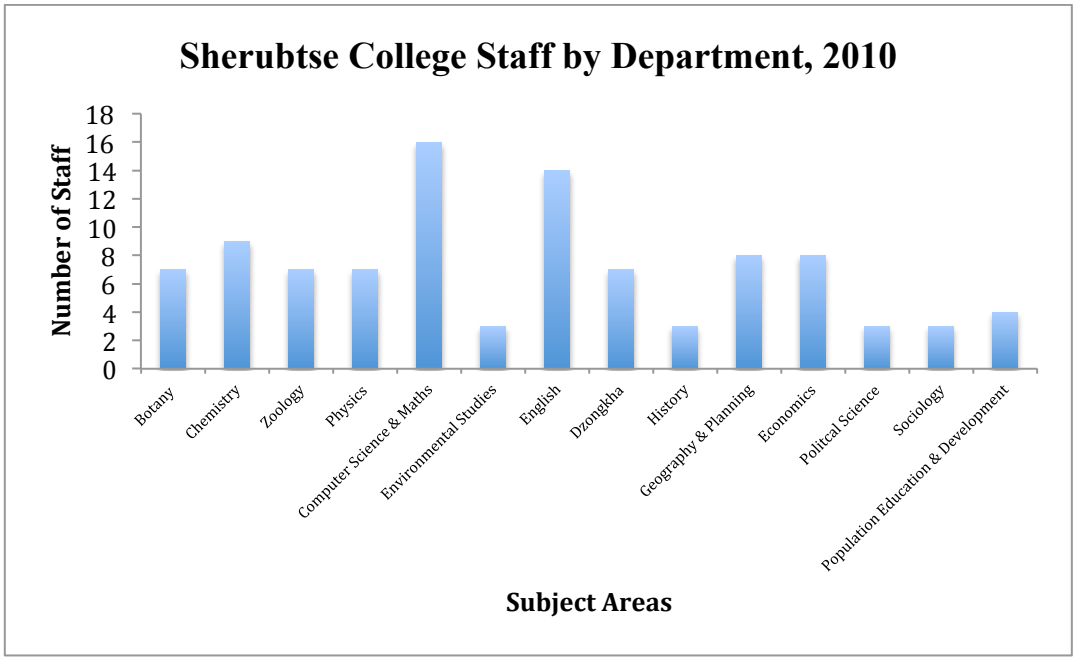

Figure 4.2. – Sherubtse College Staff by Departments, 2010 (RUB, 2011)

Within such an impressive context and with such an impressive history, the Sherubtse College case study examined the nature of teaching and learning practices of the lecturers by observing practices in the classrooms. The analytical framework used is presented in the Chapter Two.

Planning

Planning has been accorded due importance in the RUB's academic regulations and as one of the constituent colleges Sherubtse College is bound to conform to those regulations. Although module plans were prepared, written lesson plans were not in use except for one used in the Chemistry lesson (Appendix 4.1). The absence of written lesson plans for the seven other lessons indicates the extent to which lack of planning exists in the College. When the researcher requested copies of lesson plans, module plans were presented. As seven lecturers did not have written lesson plans per se, it could be construed that lesson plans were not mandatory and that their use was certainly not common practice in the College. The general trend was to use the Module plans, which included the content, learning outcomes, and instructional and assessment strategies for the semester (Appendix 4.2). Some

module plans included schedules that listed assigned contents against weeks in the semester, together with teaching and learning approaches and assessment details (Appendix 4.2), thus providing a comprehensive picture of the lecturers' and students' engagement for the semester.

Although written lesson plans were absent except for one case, the lecturers briefly communicated what they were going to teach during the pre-conference interviews. Some lecturers (e.g. Computer Science and Economics lecturers) said they had PowerPoint presentations while some said that they had lesson notes (e.g. Sociology and History lecturers). The notes and the use of PowerPoint presentations suggested some form of planning though not in an overt way. Further, it was observed that although the lecturers in the Mathematics and Botany lessons did not have any notes or PowerPoint presentations, they taught the lessons in a systematic manner, suggesting planning of some kind and perhaps considerable experience.

Written plans encourage teachers to think carefully through the phases of a lesson specifically and through each lesson generally. However there were several other possible explanations justifying the mental constructs teachers have of their lessons instead of *written* lesson plans. Consistent with the literature on teacher planning, Maxwell and Kennelly (2011), McCutcheon (1980) and Calderhead (1984) argue that these mental constructs are based on the teachers' experiences, earlier planning, their memory of the success of earlier lessons and their decisions regarding whether amendments were required, in their heads. Three of the lecturers whose lessons were observed demonstrated this skill. As they were experienced teachers (teachers who taught Botany, English and Economics), perhaps they did not need to write lesson plans because they had mental plans or perhaps they taught this content in previous years. These typically include a general sequence of lesson components and content, but not specifics, such as timing, the exact number of examples or problems.

The Botany lecturer who had taught in the College for the longest period, (25 years), and the Economics and English lecturers who had each taught for more than 10 years (Sherubtse College, 2010) could be considered 'experienced teachers'. The

Chemistry lecturer, who had taught for four years and the Computer Science, Mathematics, Sociology and History lecturers, who had only two years experience each (Sherubtse College, 2010) could be considered 'less experienced' teachers who were more likely to require written lesson plans. Without experience to call on, these lecturers might have been expected to have had written plans to guide their teaching. The novice lecturers, however, did benefit from an initial six- to twelve-month apprenticeship-style of attachment to experienced teachers. This gradual induction period gave them opportunities to familiarise themselves with the syllabus, to gain some experience, to observe and learn from colleagues experienced in their subject areas and to learn about assessment practices (S. Wangmo, personal communication, September 14, 2010). It also inducted them into the custom and practice at the College and not developing lesson plans appears to be part of the culture at Sherubtse.

Mentoring and learning in the workplace are powerful sources of change for individuals, groups, and organisations (Carter & Francis, 2001). However, there are potential negative effects of such close involvement for novice teachers. For example, seeing experienced lecturers operate without written lesson plans may lead them to believe that this is accepted practice, and therefore that writing a lesson plan is unnecessary. The fact that the College offers general degrees, in which transmission of content was accorded a place of primary importance and pedagogical content relegated to the background, may also have influenced the views of novice lecturers. The Chemistry lecturer was an exception, in that he did write lesson plans. He was not, however, a member of faculty but was employed on deputation because of a teacher shortage within the College, and came from a teacher education college where the importance of planning was considered.

In this section on Planning, although only one written plan could be observed, the plans shared 'orally' by the other seven lecturers during the pre-conference interviews, no distinction shall be made between these and written plans. The following findings address the research question – *What is the nature of lecturers planning that*

lecturers engage in as they prepare for their lessons?

Learning Outcomes

The learning outcomes (both written and oral) planned by the lecturers for their lessons are explored against the SMART criteria as explained in Chapter Two on the literature (see explanation on the use of the SMART criteria in Chapter Two p. 46)

Specificity

The LOs provided by lecturers at Sherubtse were examined for specificity on types of LOs, 'subject-specific' and 'personal-generic', as well as 'levels of thinking' from Bloom's Taxonomy (1956, revised by Anderson & Krathwohl, 2001). 80% of LOs identified by the lecturers were 'subject specific' while 20% fitted into the 'personal- generic' category. Table 4.1 provides a summary of findings related to the SMART criteria and Bloom's Revised Taxonomy.

Table 4.1. – Types and Levels of Thinking in the Learning outcomes across the lessons

Lesson	**Examples of Learning outcomes**	**Type SMART Criteria Category**	**Level of thinking (Bloom's Revised Taxonomy)**
Functions (Programming Fundamentals) (Sh.comp.lo, 14 September 2010)	*Describe the functions of programming*	Subject-specific	Understanding
	Write a simple function for a program.	Subject-specific	Creating
Application of Trigonometric Theta (Sh.math.lo, 14 September 2010).	*Understand the principles of Trigonometric Theta*	Subject-specific	Understanding
	Apply those principles in trigonometric series.	Subject-specific	Applying

Lesson	Examples of Learning outcomes	Type SMART Criteria Category	Level of thinking (Bloom's Revised Taxonomy)
Pollen Germination (Sh.botn.lo, 16 September 2010).	*To study the pollen germinability in different plant species by hanging drop method.*	Subject-specific	Analysing
Borohydrides (Sh.chem.lo, 14 September 2010).	*See the relationship between different types of boranes*	Subject-specific	Understanding
	Observe the reactions of boranes with Lewis bases	Subject-specific	Understanding
	Observe the reaction with alkynes	Subject-specific	Understanding
	Observe the preparation of higher boranes	Subject-specific	Understanding
The Way of the World (Sh.engh.lo, 15 September 2010)	*Discuss and relate the play to the plot, characters, especially of Lady Wishfort (the central character) and the categories.*	Subject-specific	Understanding Applying
Government Budgeting with reference to India (Sh.econ.lo, 13 September 2010).	*To prepare government budget in Bhutan*	Subject-specific	Applying
	Train in preparing as geog finance officers/planning officers/business	Personal-generic	Applying
Social interactions in everyday life (Sh.soci.lo, 16 September 2010).	*Understand* the *topic well*	Subject-specific	Understanding
	Understand the different concepts related to the topic	Subject-specific	Understanding
	Be able to apply the concepts in their lives	Personal-generic	Applying

Almost all LOs in Table 4.1 showed a strong focus on subject-specific content which reflects the primary thrust of the programme in the College. The major focus on subject-specific LOs indicated the College's absorption with content enhancement, a trend that was also observed in the subject module plans (Appendix 4.2). There were, however, examples of personal-generic LOs in two of the eight lessons - *Social Interaction in everyday life* and *Government Budgeting with reference to India* lessons. In contrast, the history lesson on *Jainism* had LOs such as *Give* [a] *moral lesson so that students will be disciplined* and *Give ideas to shape the students' lives* (Sh.hist.lo, 13 September 2010) were solely focussed on moral values.

The use of action verbs such as *understand, see, study,* and *give* in five of the lessons (Table 4.1) did not specify the learning experience for the students as the verbs used were ambiguous, and therefore did not satisfy SMART's specificity criterion.

With reference to Bloom's Revised Taxonomy, the levels of thinking were a combination of higher and lower levels (Table 8.3 in Appendix 8.1). 60% belonged to the lower levels of thinking mostly clustered around *understanding*, and 40% were in the higher level of thinking category mostly in the *applying* level and one each from the *creating* and *analysing* levels. However the LOs for the *Jainism* lesson were difficult to categorise since they used the term *give*. In fact, they did not satisfy the criteria for learning outcomes and seemed to be teacher-centred intentions, indicating *what the lecturer would do* in the class rather than what the *students were to do*. As asserted by Adam (2004) LOs should be concerned with the achievements of the learner rather than the intentions of the teacher.

The LOs in the written lesson plan on *Borohydrides* (Chemistry lesson) were no better developed than the ones which were oral in nature, a finding which is both counterintuitive and at odds with the literature findings. It was, however, a lone finding.

Measurability

In some cases LOs were readily measurable, whereas in others they were

difficult or impossible to measure. For example in the *Application of Trigonometric Theta* lesson, the first LO was not measurable because it contained the non-specific action verb *understand (Understand the principles of Trigonometric Theta),* while the second LO *Apply them in trigonometric series* (Sh.math.lo, 14 September 2010) was measurable. Similar examples were observed in the lesson plans for *Social Interaction in everyday life* and *Borohydrides* (Table 4.1).

One of the LOs *Train in preparing as geog finance officer/planning officers/businessmen [sic]* (Sh.econ.lo, 13 September 2010) for the lesson *Government Budgeting with reference to India* would not have been measurable at the end of a one-hour lesson. But may have been a good long-term LO, that is, for the entire module, which was geared towards training the students to work as geog/planning/finance officers (Sh.econ.mp, July- December 2010).

On the other hand in the *The Way of the World* (Sh.engh.lo, 15 September 2010) lesson, the LOs used action verbs such as *discuss* and *relate* which were measurable. The LOs in the *Functions (Programming Fundamentals)* lesson for example *Describe the functions of programming* and *Write a simple function for a program* (Sh.comp.lo, 14 September 2010) were also measurable in the lesson. The required actions were both skills-based and specified so the students would have been able to perform them during the lesson.

Achievability

There were disparities too in the achievability in the LOs of the eight lessons. As this indicator is closely linked to the criteria for measurability, intuition suggests that if the LOs were measurable, they would be achievable too. For instance, since the LOs in the *Functions (Programming Fundamentals)* and *The Way of the World* lessons were measurable, perhaps they should have been achievable too, as they were realistic. They were within the range of abilities of the students who would be able to *describe* and *write the functions of programming* (Sh.comp.lo, 14 September 2010) in the *Functions (Programming Fundamentals)* lesson. Similarly, in *The Way of the World lesson*, students would be able to *discuss* and *relate* to the play (Sh.engh.lo, 15

September 2010). Other examples from the *Borohydrides (*lesson *observe the reaction of boranes with Lewis bases)* (*apply them* [the principles] *of trigonometric Theta)* in the *Application of Trigonometric Theta lesson* (Sh.math.lo, 14 September 2010) and *prepare government budget* in the *Government Budgeting with reference to India* lesson (Sh.econ.lo, 13 September 2010) were achievable LOs.

On the other hand, the use of action verbs such as *understand* and *see* hindered the practicability of the LOs making them ambiguous and therefore not achievable or at least difficult to determine. The two LOs in the History lesson *Jainism - Give* [a] *moral lesson so that students will be disciplined* and *Give ideas to help shape the students' lives* (Sh.hist.lo.13 September 2010) presented a problem as they were not realistic, and it was difficult to measure how the students would become disciplined as a result of the lesson or how it would they shape their lives. These are aspirational notions and not realistically achievable in the lesson.

Therefore investigation of the achievability criteria also revealed differences across the LOs. Some were achievable because they indicated the skill and knowledge students should be able to acquire by the end of the lesson, whilst others did not specify such outcomes, so were not achievable.

Relevance

The LOs for the eight lessons were relevant to the students' lives as they prepare students for future employment and are largely consistent with the LOs in the module plans (Appendix 4.2). As the module plans guide the lessons, logically the LOs should be based on the modules, and further extended/simplified to make them relevant in the classroom context. Such examples were seen in the *Social Interactions in everyday life* LOs which mapped the link between the module LOs with the lesson LOs. This is as shown in Table 4.2.

Table 4.2. – Relevance of Lesson Learning Outcomes for *Social Interactions in Everyday Life*, 2010 (Sh.soci.lo, 15 September 2010).

Module Learning Outcomes	**Lesson Learning Outcomes**
Understand the concept of social change and examine how Bhutan has economically and socially changed since 1961	*Understand the topic well*
Critically analyse Bhutanese society, culture, and economy through sociological perspective	*Understands the different concepts related to the topic.*
Relate the concepts and theories to their personal lives and be active learners.	*Be able to apply the concepts in their lives*

Table 4.2. shows a clear association between the module and lesson outcomes, indicating that the module LOs guided the development of the lesson LOs. Similar patterns of congruency between the lesson and module LOs were observed in *The Way of the World*, *Application of Trigonometric Theta, Government Budgeting with reference to India*, *Pollen Germination* and *Borohydrides* lessons.

However the LOs for the *Jainism* lesson were not congruent with the module LOs. The lesson LOs focussed on moral values as explained earlier, whereas the module LOs were focussed on subject content (Appendix 4.2). This indicates that the lesson LOs were not developed according to the guidelines and suggests they were individualistic interpretations by the lecturers.

Time-Scaled

The LOs for the lesson were generally planned appropriately for the available time frame. The LO for the *Pollen Germination* lesson allowed for a three hour period for the experiment on pollen germination, whilst one-hour periods were planned for the other lessons. However the LO *Train in preparing as geog finance officers/planning officers/business* in the lesson *Government Budgeting with reference to India* (Sh.econ.lo, 13 September 2010) would require more than the one hour allotted, and therefore was not appropriately time-scaled.

To summarise, inconsistent practices were identified in the development of

LOs with some being specific, measurable, achievable, relevant and time-scaled whilst others were neither specific or measurable, and therefore not achievable, and yet others simply not relevant. The LOs prepared for the *Functions (Programming Fundamentals)* and *The Way of the World* lessons included satisfactory examples of LOs, which approached the standards set by the SMART criteria, whereas the LOs in the *Jainism* lesson clearly did not.

The LOs demonstrated a general pattern that focussed more on knowing than doing. An exception to this pattern appeared in the LOs for the *Functions (Programming Fundamentals)* lesson, which were skills-based.

Teaching and Learning Approaches

In this section teaching and learning approaches of the Sherubtse College lecturers involved in this study are explored in order to identify how the eight lecturers planned to promote student learning in their lessons. The related indicators provided in Chapter Two provide the analytic framework.

Organises active engagement with learning tasks

Overall, the 'lecture' appeared as the most common vehicle employed by lecturers for the engagement of students. The only exception was the practical session for the *Pollen Germination* lesson in which students were to conduct experiments (Appendix 4.3.8 for). During the pre-conference interviews, the lecturers advised that they would use PowerPoint presentations to present information to the students (e.g. Economics and Computer Science lessons). This suggested a conventional and passive 'lecture' style of presentation in which student engagement with learning tasks would not be undertaken. However, the use of the term 'lecture' did not necessarily indicate that passive learning would follow. The lecturers who taught the classes *The Way of the World* (Sh.engh.lo, 15 September 2010) and *Social Interactions in Everyday Life*, (2010 (Sh.soci.lo, 15 September 2010), indicated that they would have class discussions and Q&As following, or during the information input segment, thus indicating a more active level of engagement than the term 'lecture' implied. Similarly the written lesson plan for the

lecture '*Borohydrid*es', included '*Discuss and describe the structural correlations of different types of boranes'* (Sh.chem.lp, 14 September 2010) which suggested that some level of active student engagement was planned. .

The module plans for these subjects also made reference to 'lecture' as the main teaching and learning approach (Appendix 4.2. for relevant module plans). From these data, it was evident that the conventional 'lecture' was commonly planned for the lessons.

Provides opportunities for interaction amongst students and with the lecturer

In the lesson pre-conference interviews prior to *The Way of the World* and *Social Interactions in Daily Life* lessons and the written lesson plan for the '*Borohydrides*' lesson, the lecturers made reference to planned interaction between students and the lecturer. These were described as class discussions and Q&As (Sh.fld.nt, 11-18 September 2010). In the pre-conference interviews for the other five lessons, no reference to alternative forms of interactions was made. It was significant that several other forms of interaction, such as classroom discussions, group work and presentations in the *Public Finance* module plan (Appendix 4.2.1) were mentioned in the module plan for this subject but were not carried over to the lesson plan. Similarly group work was listed in the *Functions (Programming Fundamentals)* module plan (Sh.comp.mp, July-December 2010) and discussions in the *Plant Diversity - II* module plan (Sh.botn.mp, July-December 2010) in the teaching and learning approaches to promote interaction between students and lecturer but these were not evident in the lessons plans. If these lesson plans were typical then it seems that the modules plans were not used as a guiding framework. Conversely, in some module plans such as the *Inorganic and Physical Chemistry,* and *Discrete Structure*, no reference was made to interaction between students and lecturers; the lecturers' lesson plans also failed to include them.

Initiates vigorous and critical interaction with knowledge content (invokes deep learning)

During the pre-conference interviews for the lessons, and in the written lesson

plan, this particular indicator was not evident. The Sociology and English lecturers, however, noted that they would *use Q&As and discussions* in the lessons (Sh.fld.nt, 11-18 September 2010) which indicated some interaction with the knowledge content, but not necessarily critical interaction. However, the nature of the *vigorou*s and *critical* interaction would be more likely to appear in the Implementation Phase, as these are qualities of interaction that need to be observed.

Although *'lectures'* were the main approach used in teaching and learning, some of the lecturers had Q&As and class discussions included in their mental constructs of the lessons. This could promote some level of active and deep learning in those lessons. Other lecturers did not mention them, which implied that they had not thought of them; instead they focussed on the content they planned to teach.

Content Knowledge

In this section the depth, breadth and relevance of content knowledge planned for the eight lessons are examined. These characteristics were not included specifically, but were implicit in the only written plan on *Borohydrides* for the *Lesson Development* segment of the written plan (Appendix 4.1). The other lecturers simply mentioned the topics that would be taught in the lessons. For example in the *Jainism* lesson, the lecturer mentioned that the lesson would be on Religious History on the topic '*Jainism*' taken from the module '*History of India'* (Sh.fld, jr, 11-18 September 2010). Other than in the topic itself, details of the content were not mentioned. Other lecturers made similar kinds of communications for the six lessons. They provided little information regarding the depth, breadth and relevance of the topics. This category needs to be considered carefully in the Implementation Phase.

With reference to the module plans, however, sufficient depth, breadth and relevance of the topics were included (see Appendix 4.2 on Module plans for details). For example, in the *History of India* module plan, the list of topics and sub-topics (listed under *Activity*) showed the depth and breadth of the subject adequately (Appendix 4.2.1). This pattern was consistent in the other seven module plans, which recorded suitable depth and breadth of the subject matter for the module as a whole.

As the content in the module plans formed a part of the programmes leading to a Bachelor in Arts/Science/Computer Science, they indicated their relevance to them.

Assessment

In this section the types of assessment planned for the lessons are examined against the indicators identified in Chapter Two. In none of the 'oral' lesson plans was any reference made to assessment during the lesson pre-conference interviews. In the written lesson plan *Borohydrides*, however, the lecturer referred to informal formative assessment in the Lesson Introduction in the following terms: *Recapitulate on the classification of boranes, bonding, preparation of diborane and properties of disborane. Highlight on the topic that will be discussed, made links to the new lesson* and in the lesson closure *Ask questions, assign extended tasks like reactions* (Sh.chem.lp, 14 September 2010). These statements provided information about assessment of prior learning in the lesson introduction segment, and assessment of current learning in the closure segment of the lesson as well as of the fact that the lecturer was a teacher educator. More detailed information on the informal formative assessment needs to be carefully considered in the Implementation Phase.

Resources

Resources planned for the lessons are examined for effective use and variety to enhance learning. Resources such as PowerPoint presentations for the *Government Budgeting with reference to India*, and Functions (*Programming Fundamentals)* lessons, the textbook for the *The Way of the World* lesson, and the laboratory apparatus for the *Pollen Germination* lesson were advised by the lecturers. The Chemistry and Sociology lecturers advised the use of the chalkboard for their lessons on *Borohydrides* and *Social Interactions in Everyday life*, as they could not get access to the LCD projectors to present lessons using PowerPoint presentations (Sh.fld, nt, 11- 18 September 2010). The other lecturers, however, did not mention resources that would be used in the lessons to promote learning and enhance their teaching.

Role of Teacher

The central role of the teacher was evident in that the lecturers developed the lessons whether in written form or as mental constructs. The lecturers were mindful of their role as lesson planners in that they were ready to talk (even though briefly during the pre-conference interviews) about the learning outcomes they intended for their lessons, and what they were going to teach in the lesson (eg Sh.fld.nt, 11-18 September 2010). Although they did not provide details about the lessons, they shared the essential information and appeared on top of their teaching role.

Role of the Student

During the lesson pre-conferences interviews, the roles of the students were not clearly specified, as no direct references were made to them. Regarding the *The Way of the World* lesson, however, during the pre-conference interview, the lecturer advised that there would be discussions during the lesson; students were directed to read the text beforehand and to come prepared to get involved in the discussion and to answer questions (Sh.fld.nt, 11-18 September 2010). This strategy indicated the lecturer's acknowledgement of the importance of students taking responsibility for their own learning. Moreover, getting students to come prepared to class with some background knowledge transforms students from passive to active learners (Ryan, 2008) as they can make contributions to the discussions.

Summary

This analysis has addressed the research question: *What is the nature of lecturers planning that lecturers engage in as they prepare for their lessons?* and identified a number of findings. Significant among these was with the exception of a solitary written lesson plan in Chemistry, written plans were not common practice by lecturers in the College. Instead, lecturers mostly used PowerPoint presentations and content notes as lesson guides, and relied heavily on the Module descriptors in the syllabus handbook. Evidence gathered during the pre-conference interviews with the seven lecturers prior to observation of the actual lessons indicated that although seven of the eight did not write lesson plans, lecturers had mental constructs of how and what

they were going to do in the lessons.

Failure to accord due importance to writing lesson plans suggested the greater importance given to *subject content* than *pedagogical content knowledge* (PCK). Had PCK been considered, then the lecturers would more likely have had prepared lesson plans which are generally understood to be an important component of teaching and learning. Kizlik (2012, p. 1) asserted that when teachers are able to create their own lesson plans, they have taken a giant step toward 'owning' the content they teach and the methods they use.

The findings also suggested that there was a lack of understanding of the different levels of planning. Absence of proper lesson plans may explain why most of the LOs had a strong content focus, with just a few personal generic ones. Content in the lessons was the central focus as became evident during the pre-conference interviews. During those interviews, lecturers disclosed their LOs, and described the content to be covered in the lesson. There was little attention, however, paid to *how* they were going to promote student learning in the lesson. There were two notable exceptions, the first in the pre-conference interview prior to the *Social interactions in everyday life* lesson and the second in the *The Way of the World* pre-conference interviews.

Some of the LOs that were developed loosely met the SMART criteria, while others lacked the essential attributes of LOs. Consequently other than the Chemistry written plan little consideration was paid to the use of informal formative assessment. Also, little thought was given to planning for teaching and learning approaches beyond the conventional 'lecture' and some inclusion of minor class discussions and Q&As.

In the lesson plans, resources to support and enhance teaching and learning were few, and included PowerPoint presentations and essential lesson sources such as textbooks.

In the Planning phase, the lecturers took central stage, as it was they who decided on the lesson content and the learning outcomes, while students had a minimal role. Thus planning practices were teacher-centred, but did include intention

to support student learning.

Implementation

In this section, data from the *Lesson Observations, Students' In-Lesson Questionnaires, Staff and Student Interviews* and the *Field notes* are examined with a view to answering the research question *How do the lecturers implement their prepared plans in a way that supports student learning?* The same seven categories applied to the Planning practices of the lecturers and related indicators are used to guide exploration of the implementation of the lesson plans.

Learning Outcomes

The discussion addresses what learning outcomes were evident during implementation phase.

It was observed that the LOs planned by the lecturers for the eight lessons were largely implemented. For example the LOs *discuss* and *relate* listed in Table 4.1 in the lesson *The Way of the World* were implemented. The lecturer had Q& As and small activities such as reading and group discussion which ensured that students were able to 'discuss and relate' as she had planned. In the *Jainism* lesson the LOs *Give [a] moral lesson so that students will be disciplined* and *Give ideas to shape the students' lives* were evident in the lesson. The lecturer had presented a rich selection of ideas on various topics such as perceptions of god, heaven and hell using examples of nihilism and annihilation, Karma and transmigration, and the Dalai Lama's perception of god (Sh.hist.lo, 13 September 2010) to achieve the two LOs. Similar patterns were observed in the other seven lessons in which lecturers ensured that the LOs were achieved, by explaining, asking questions, demonstrating examples, assigning problem solving of the students and science practical experiment.

However only in one of the lessons the *Government Budgeting with reference to India*, the LO: *Train in preparing as geog finance officers/planning officers/business* (Sh.econ.lo, 13 September 2010), was not evident in the lesson. Its achievement was not possible within the timeframe of the class.

Determining whether LOs had actually been achieved for the students, however, would have been difficult for lecturers in some contexts, particularly as seven of the eight lessons were conducted using the *'lecture'* method. Because not all the students actively participated in the subsequent Q&A sessions, class discussion, problem solving tasks, it was not possible to assess whether *all* the students had achieved the LOs set for these lessons. In the *Pollen Germination* lesson since all the students conducted the practical experiment and compiled their results, it could be said that all of them had largely achieved the LOs set out in the lesson.

Besides the implementation of planned LOs, several LOs that were unplanned were observed being implemented in the eight lessons. The unplanned LOs have been referred to as the 'hidden curriculum by Jackson (1968) and as norms and principles by Giroux (2001), evidences of which were noted in the lessons.

The unplanned LOs were mostly of the personal generic types focussed on norms and principles and creation of conducive classroom environments. For example in the case of the lesson *The Way of the World*, the additional 'hidden' learning outcome was that student take responsibility for their own learning. The existence of this learning outcome could be deduced from the lecturer's expectation that students would read the text before the lesson (Sh.engh.lo, 15 September 2010). The lecturer's repeated reminders to the students that they should have read the text before the lesson, was an example of making the students responsible for their learning, and emphasised study skills. It was a hidden LO as the English lecturer had not communicated this LO in the pre-conference interview.

In four of the lessons the additional hidden LOs were related to creation of a positive classroom environment for learning. *In the Social Interactions in everyday life, Pollen Germination*, *Government Budgeting with reference to India* and *Borohydrides,* the lecturer's good-humoured, enthusiastic, disciplined, accommodating and amicable behaviours hinted at the importance of a positive relationship to promote and encourage student learning.

Conversely in the other two lessons *Functions in Programming Fundamentals*

and *Application of Trigonometric Theta* lesson, the total absorption of the lecturers in their teaching made them unaware of the students' needs and impacted student learning.

In summary, there were additional LOs besides the planned LOs that were implemented in the eight lessons. The unplanned LOs were of the personal-generic type. In some the hidden LOs enhanced the learning experience of the students, by obliging them to take responsibility for their own learning and by the creation of a conducive atmosphere in the class.

Teaching and Learning Approaches

In this section, approaches to teaching and learning that were recorded during the lesson observations are explored using the indicators identified in Chapter Three. Data from *Lesson Observation records, Student In-Lesson Questionnaires, Staff and Student Interviews* and *Field Notes* are analysed.

Organises active/passive engagement with learning tasks

The 'lecture' was the most common approach with the exception being the practical session for the *Pollen Germination* lesson. Variations were evident in the ways the 'lecture' was used, with the most interactive lecture occurring in the Sociology lesson on *Social Interactions in Everyday lives*. The lecturer used the Q&A strategy as an effective engagement trigger, encouraging students to share views, jokes where appropriate, and to voice their opinions (Sh.soci.lo, 15 September 2010). The warm, friendly relationship between the lecturer and students clearly enhanced the learning experience. According to the data in the In-Lesson Questionnaire, students' feedback confirmed that they were actively engaged in the class:

- *As usual she allows all the students to participate and as usual the class ended interestingly;*
- *The class was as usual very interesting;* and
- *We always have discussions and give our opinions and examples* (Sh.soci.lq, 15 September 2010).

This feedback is indicative of the high level of engagement and of the supportive and open learning environment in the classroom. The level of interaction and

participation in the *The Way of the World* lesson was not as high as observed in the Sociology lesson although the lecturer used Q&As to initiate class discussion. The students were not as forth coming even though the lecturer paused in between explanations to ask probing questions, directing the students to think. Despite questions such as *'What do you see there', 'Do you see the links?'* and *'Why did so and so do/say that?'* only a few volunteered to answer (Sh.engh.lo, 15 September 2010). Additional brief activities such as reading and group discussion were also organised to engage the students in the lesson. In the *In-Lesson Questionnaire,* students commented about limited opportunities for engagement in the lesson:

- *It would be better if sometimes we are made to do group discussions;* and
- *We are pleased with her way of teaching but literature is such a subject that we have little interactive sessions* (Sh.engh.lq, 15 September 2010).

These comments indicated that the students wanted to be more actively engaged in the lesson although brief activities had been arranged in the lesson which may have only partially engaged them. Similarly in the *Application of Trigonometric Theta* lesson, the lecturer used some questions of higher order thinking while explaining and demonstrating the application of concepts. This encouraged student involvement and provided links to previous learning. Questions such as '*What is tangent theta equal to in trigonometry according to the unit circle?', 'If tangent theta equals zero, what does the theta equal?',* and directions like *'Find the sine, cosine and tangent of….'* were used in the class (Sh.math.lo, 14 September 2010). The lecturer also demonstrated examples of problem-solving and assigned a problem to the students to solve. However, since the lecturer too simultaneously solved the problem together with the students (guided practice), this only *partially* engaged the students in their learning. Moreover only some students, particularly those sitting in the front rows in the class actively responded, and participated in the lesson. In the *In-Lesson Questionnaire*, comments given by the students highlighted the conflicting situation regarding their engagement:

- *There was class interaction … because sir gives us*

opportunity to solve some exercise and even ask questions;

- *He asks questions individually;* and
- *If sir could give us group works, have question-answer sessions and more class work. I think it will be much helpful for us* (Sh.math.lq, 14 September 2010).

A similar observation was made in the *Functions (Programming Fundamentals)* lesson because although there was demonstration by the lecturer followed by asking students a simple function for a programme, she too simultaneously worked out the programme together with the students (Sh.comp.lo, 14 September 2010). Thus the students were kept only partially engaged in the lesson. In the *Borohydrides* lesson the lecturer endeavoured to engage the students through asking questions and getting students to solve chemical equations. The level of engagement was slightly more as the lecturer asked questions of students at random, picking ones who had not raised their hands and was particularly vigilant of students who had strayed away from the lesson (Sh.chem.lo, 14 September 2010).

Two lessons, which were typically conventional lectures, were the *Government Budgeting* and *Jainism* lessons with more teacher talk and students engaged in passive listening, or writing notes and responding to a few questions (Sh.econ.lo, 13 September 2010 and Sh.hist.lo, 13 September 2010) and therefore not actively engaged with the learning tasks.

The *Pollen Germination* lesson was the only lesson that engaged all the students with the learning task by virtue of it being based on a practical activity. The students conducted the experiment individually to study pollen germination using the hang drop method (Sh.botn.lo, 16 September 2010).

Thus although the levels of engagement varied, it was limited in most lessons and not as might be expected in tertiary level degree classes.

Provides students with opportunities for interaction with each other and with the lecturer

Varying levels of interaction were observed across the eight lessons. Relatively higher levels of interaction were seen in the *Social interactions in*

everyday life, Pollen Germination and *The Way of the World* lessons. As explained earlier, the *Pollen Germination* lesson was a hands-on practical session; students were observed interacting with each other during the experiment. They consulted with each other over the results, and with the lecturer when he moved around the classroom to monitor their work. (Sh.botn.lo, 16 September 2010). Similarly in the *Social interactions in everyday life* lesson, the lecturer created a learning atmosphere in which the students could interact with the lecturer during the Q&A session, and with each other when sharing their opinions with the class (Sh.soci.lo, 15 September 2010). Data in the *In-Lesson Questionnaire* for the Sociology lesson revealed that 100% of the students agreed that the lecturer '*Encouraged me to participate'* (Sh.soci.lq, 15 September 2010). Further comments corroborated the observation findings:

- *She always as usual encourages 100% class participation and respects our opinions;* and
- *The atmosphere is very open where we can raise our opinions, views and examples* (Sh.soci.lq, 15 September 2010).

Likewise in *The Way of the World* lesson, the students interacted with the lecturer through the Q&A session and with each other during the activity in small groups (Sh.engh.lo, 15 September 2010). However the degree of interaction with the lecturer, as observed earlier, was not as high as it was in the Sociology lesson, as it was only the students who volunteered to answer the questions, who interacted with the lecturer. In the small group activity they interacted with each to derive significance of the '*Song set by Mr. John Eccles*' in the text of the play but it was for only six to eight minutes of the lesson. In the *In-Lesson Questionnaire* of the English lesson these students commented on the low level of interaction (Sh.engh.lq, 15 September 2010).

Besides these examples, interactions in the other six lessons were mostly from the lecturer to the student (explaining the content) or the students to the lecturer (answering the questions). For instance in the *Application of Trigonometric Theta* lesson, the lecturer spent a great amount of time writing on the board while explaining and demonstrating trigonometric problems. He asked questions while the

students mainly copied the board work, attempted to solve the problem and responded to the questions when asked (Sh.math.lo, 14 September 2010). Overall, interactions in the classes were low in comparison with that seen in the Sociology, followed by the Botany and English lessons. Markedly lower levels of interaction occurred in the other lessons where 'lecture' was predominant, and little opportunity was provided for any kind of interaction.

Initiates vigorous and critical interaction with knowledge content (invokes deep learning)

Not much of this type of interaction was evident in any of the eight lessons observed, although some efforts to encourage interaction were seen in the English and Sociology lessons. For example, in the *The Way of the Wo*rld lesson, the lecturer initiated discussion, asking students to analyse the characters and the themes of the play. She used questions to scaffold students' learning by stimulating them to analyse the characters and the themes in the play. Besides, the lecturer shared additional information regarding the historical and cultural context of the play, making to references to the various issues that emerged (Sh.engh.lo, 16 Sept 2010). In the *In-lesson Questionnaire* students provided feedback on this aspect of the lesson:

- *The lesson taught was precise and appropriate to the text. Was provided with clear idea of the background of the author and the period* (Sh.engh.lq, 15 September 2010).

Textbooks were the main resource used in the lesson for the students to interact with the lesson content. Questions were asked from it, promoting some kind of deep learning as they involved critical analysis of ideas in the play, linked them to other acts of the play and led to understanding.

Similar trends of interaction with the lesson content to encourage deep learning were observed in the Sociology lesson. The students were asked to participate in the lesson discussion, share their opinions and examples with the class (Sh.soci.lo, 15 September 2010) thus interacting with the content knowledge. Some level of deep learning was evident in the manner the students responded to the

questions by simply not stating facts, but analysing the various concepts shared in the lesson such as 'Idealism, embarrassment, and relating examples/experiences from their own lives.

However in the *Government Budgeting* and *Jainism* lessons the students listened passively and made notes or copied the PowerPoint slides/board work. This was seen as surface learning, as students were simply receiving what the lecturers presented on the slides and lecture, and not really asking questions or discussing ideas. In the *Borohydrides, Application of Trigonometric Theta*, and *Functions (Programming Fundamentals)* lessons, the lecturers attempted to engage the students with the content while demonstrating examples and assigning similar problems to solve by asking questions, and encouraging students to write functions of a simple program, and solve problems respectively through guided practice. These examples illustrated the attempts lecturers made to invoke some level of deep learning during the lessons.

To summarise, 'lecture' was the main approach used in the seven lessons although with some variations, such as those observed in the Sociology and English lessons, and the one lesson *Pollen Germination* which was a practical exercise. Further additional activities, which were apparently not intended or at least not mentioned prior to the lesson, were implemented enhancing learning in some of the lessons. Yet, active engagement was seen only in a few lessons while in most students listened passively to the lectures and made notes. Interactions, both with other students and with the lecturer, and engagement with the content knowledge, were limited to the lessons for which the lecturers organised active student engagement.

Content Knowledge

Relevance, depth and breadth of content taught in the eight lessons were examined for the eight lessons observed. The lessons ranged across levels, from Year 3 Mathematics and Economics, to Year 2 Chemistry and History, and Year 1 English, Computer Science, Sociology and Botany.

Depth and Breadth of content

For the purposes of this analysis, it was necessary to accept the expertise of the lecturers involved in the study, as given. Analysis is based on what I observed and understood.

The lessons showed varying degrees of depth and breadth of the content. For example depth and breadth of content in the lesson on *Government Budgeting with reference to India* appeared adequate as the lecturer covered five topics, namely *Market loans, special deposits, external assistance, recovery loans and advances* and *small savings and provident fund*s during the one hour lesson. Lesson content was provided using PowerPoint slides which contained adequate information on the topics being lectured (Sh.econ.lo, 13 September 2010).

Similarly, in the other lessons, the depth and breadth were mostly appropriate for the level and requirement of the course. The exception was the History lesson on *Jainism* whose content was rather scanty as the lecturer discussed several issues besides the lesson topic. The depth and breadth of the content were, therefore, difficult to identify.

Links content to other subject areas and everyday life of students

Linking to other subjects was done obviously and effectively in the *The Way of the Wor*ld lesson, with the lecturer alluding to the historical and cultural period of the play and drawing the class's attention to the various class and social issues that emerged during the explanation of Act III of the play (Sh.engh.lo, 15 September 2010). In the *Borohydrides* lesson, the Chemistry lecturer explained how the atom structures of boranes were useful as fuels for jet engines and how kerosene, petrol and diesel became volatile when the atom structures changed, making different combinations (Sh.chem.lo, 14 September 2010). Similarly in the *Social interactions in everyday life* lesson, the lecturer illustrated concepts such as embarrassment, tact and idealisation using several examples from her personal life. Anecdotes were also shared and students were encouraged to do the same to establish the link to everyday life (Sh.soci.lo, 15 September 2010).

Apart from these three examples, such links were not evident in the other lessons. The case of the history lesson on *Jainism*, however, was different. In that lesson, the lecturer made reference to several concepts that students could relate to, but since they were not part of the discussion on *Jainism* their relevance to the *actual* context of the lesson was questionable, even though the ideas were interesting to the students who listened raptly. Therefore it was not surprising that their responses to the class were positive, and their comments in the *In-Lesson Questionnaire* positive. For example:

- *The lecturer is quite expert and have* [sic] *all the skills in making us appropriate learners;* and
- *Sir is teaching with action, good communication, make us to debate and discussion and questioning* [sic] (Sh.hist.lq, 13 September 2010).

The manner in which the lecturer highlighted issues using attention-grabbing but rhetorical questions was fascinating but skirted around the main topic *Jainism*. Links were not established, nor the significance explained to the lesson's context (Sh.hist, lo, 13 September 2010). McCombs (1992) asserts that more information does not necessarily mean more learning, because learners seek to create meaningful uses of knowledge regardless of the quantity and quality of information presented. Therefore, apart from the *Jainism* lesson, the content knowledge in the lessons was well established and highlighted the emphasis on content knowledge in the College.

Assessment

The types of assessments used by the lecturers in the eight lessons that were observed, are examined using the indicators identified in Chapter Three.

Selects, constructs and utilises appropriate assessment strategies (formative and summative)

The most common type of classroom assessments observed in the lessons was informal formative assessment, characterised by informal conversations such as teacher dialogues and discussions with students. For example in the *Borohydrides* lesson, the lecturer used questions to do a quick check for knowledge and

comprehension during the lesson. He asked questions after each explanation of the theory on preparation and structural relationships of *boranes and borohydrides, hydroboration and reaction with nitric acid*. Throughout the lesson, questions were intermixed with explanations, which were, at times, linked to previous knowledge and at other times on the new knowledge being explained (Sh.chem.lo, 14 September 2010).

Similar patterns were evident in the other lessons where questions were used in conjunction with 'lecture' to check understanding of the content (e.g. Mathematics, English and Sociology lessons). In most of the lessons, the questions were convergent closed type, requiring straightforward factual answers whose main purpose was to check retention of knowledge. For example, students were asked to 'describe' or 'explain'. Examples of such questions included *What is the geometry of this structure (borane atoms)* in the *Borohydrides* lesson (Sh.chem.lo, 14 September 2010), and *How does function work*? in the *Functions (Programming Fundamentals)* (Sh.comp.lo, 14 September 2010) or *What is market loan*? in the *Government Budgeting with reference to India* lesson (Sh.econ.lo, 13 September 2010). The questions were mainly asked to check understanding but were not used to take it to the next level of learning. This corresponded with Black and Wiliam's (1998) assertion that many teachers do not plan and conduct classroom questioning in ways that might help students learn. Whereas in the *The Way of the World* lesson, the lecturer made insightful suggestions, after requesting that students read and reflect on the meaning and significance of the 'song' in the text of the play. For example, "*What can you make out in the song?", "Think what it is about", "What is the story in the song*?" These questions/suggestions were not closed questions and allowed the students to use higher order thinking like analysis and application. In the *Social interactions in everyday life lesson* the lecturer used open, stimulating questions such as "*Why do women in Bhutan not use their husband's last name after marriage*?" (Sh.soci.lo, 15 September 2010). This question, which involved a cultural issue that had probably not been previously questioned, but merely accepted as a cultural norm, prompted students to think. In the *Application of Trigonometric Theta* lesson (as

described in an earlier section under *Teaching and Learning Approaches* - see page 113) higher order questions were also asked in the classroom. These questions related to concepts and procedures of the lesson content and to check understanding as well as to engage the students (Sh.math.lo, 14 September 2010).

In the *Pollen Germination* practical lesson the lecturer employed summative assessment as well as informal formative assessment. Students work (drawing and recording observations of the different stages of pollen tubes), was monitored by the lecturer who also marked and provided feedback about their work (Sh.botn.lo, 16 September 2010). Both summative and formative assessments were observed only in this lesson.

Assesses prior knowledge of student learning

Assessment of prior learning was carried out directly in two of the lessons observed. It was conducted more meaningfully in *The Way of the World* lesson with the lecturer spending approximately 20 minutes of the lesson assessing prior knowledge by asking students to recount the entire episodes of the play (Sh.engh.lo, 15 September 2010). This practice ensured thorough understanding of the previous Acts of the play and helped to build better contextual understanding for the students. Students in the *In-lesson Questionnaire* commented on the importance given by the lecturer to this aspect of the lesson. One said "*The way she introduces us the subject matter and deals with the contextual situation"* (Sh.engh.lq, 15 September 2010) implying the lecturer's thoroughness.

Assessment of prior learning was also effectively performed in the *Government Budgeting with reference to India* lesson in which the lecturer diligently clarified earlier misconceptions and cited examples of the previous lesson's concepts on *Revenue and Capital Budget,* before embarking on the new topic (Sh.econ.lo, 13 Sept 2010). In the *Pollen Germination* lesson the lecturer referred the students to previous content covered and asked the students to consider them while conducting the experiment (Sh.botn.lo, 16 September 2010).

In the *Borohydrides*, *Social interactions in everyday life*, and *Jainism* lessons,

the lecturers simply asked questions at the beginning of the lesson to recap previous learning. The questions were used as routine procedures rather than to assess prior learning, as done in the English and Economics lessons.

On the other hand, in the *Pollen Germination, Application of Trigonometric Theta,* and *Functions of Programming Fundamentals* lessons the lecturers made references to previously learnt content, but did not assess the students' prior learning. Thus, practices were not consistent across the eight lessons.

Resources

Resources used during teaching of the eight lessons included textbooks, reference books, Botany laboratory apparatus related to the experiment, chalkboard and PowerPoint presentations. For example, in the English lesson *The Way of the World*, the textbook was used extensively for students to read aloud, explain, describe the role of the central character using appropriate words, describe the events, and to discuss historical and cultural issues emerging from the play (Sh.engh.lo, 15 September 2010). The students had a copy of the textbook and referred to the text during the lesson, thus making associations with the explanations and discussion that occurred.

PowerPoint presentations were utilised in only two lessons - *Functions (Programming Fundamentals)* and *Government Budgeting with reference to India*. In the latter, the lecturer used slides for information dissemination. He had prepared slides for the entire lesson, beginning with revision of the previous lesson on *Revenue and Capital Budget*, and then presenting a lesson overview, and the main topic. The slides were shown, read aloud and explained, with time allotted for students to copy the slide information (Sh.econ.lo, 13 September 2010). On the other hand, in the *Functions (Programing Fundamentals)* lesson, the lecturer used the PowerPoint slides to explain the functions of programming, asking questions at times during the presentation. In addition, she used the chalkboard to demonstrate the procedures involved in writing a simple function. The use of the two resources was well coordinated, one for the theory and the other for the practical application of

writing a simple program (Sh.comp.lo, 14 September 2010).

The chalkboard was utilised in four lessons - *Borohydrides, Jainism, Social interactions in everyday life* and *Application of Trigonometric Theta*. However its use was exemplary in the *Application of Trigonometric Theta* lesson, it was presented in a neat and well-organised manner, presenting a well-sequenced logical line of development of the lesson (Sh.math.lo, 14 September 2010).

The *Pollen Germination* lesson was the only one conducted in the science laboratory, which was organised and arranged with the essential apparatus for the hang drop experiment for the 20 students. The lecturer directed the students to work on the experiment, using the apparatus and materials to observe the pollen from fast flowers stimulated to geminate in the sucrose-salt solution and see the pollen tubes growing from the pollen grains (Sh.botn.lo, 16 September 2010). The presence of the laboratory assistant was an added bonus for the lesson, as he was very active and attentive to the students' needs. The laboratory assistant, prior to the lesson had prepared the apparatus and solutions.

The physical space for lessons varied. It was fairly conducive to teaching and learning when student numbers were small, as in the *English, Sociology*, and *Botany* classes whose student numbers ranged from17 to 20. The rooms were well-ventilated, bright and spacious with adequate furniture, which could have affected students' behaviour in the classroom; it was observed that students did not sleep or get distracted.

However, in classes with larger numbers of students such as Mathematics with 55 students, and Computer Science with 50 students, the rooms were congested, and furniture arranged in the traditional rows of chairs with the writing tablets. Some of the students needed to cluster close to the chalkboard and the LCD screen for visual access. It made the class look rather disorderly and could have been a demotivating factor, which allowed students to disengage themselves from the lessons. It was difficult for students at the back of the class to see the board work in the *Application of Trigonometric Theta* lesson, and to hear clearly in the *Functions*

(Programing Fundamentals) lesson. In the latter, the lecturer used the LCD projector for the PowerPoint presentations.

Overall, there was a modest use of resources in the lessons, with the main approach to teaching being transmission of information. In the few variations to that, resources were not required.

Role of Teacher

The role of the teacher is explored in light of the three indicators described in Chapter Two.

Creates conducive environments

There were some variations in the way the 'cognitive spaces' were created by the eight lecturers who set expectations and created conditions designed to motivate students.

The use of 'cognitive space' was most notable in the *Social interactions in everyday life* lesson as clear expectations of performance as well as behavioural boundaries were communicated to the students. As noted earlier, the lecturer was very pleasant, open and good-humoured, and encouraged the students to interact and participate in the lesson. She enjoyed a good relationship with the students. Her use of humour enhanced participation and enlivened the class. The body language of the students indicated their interest and enjoyment in the lesson; they leaned towards her, indicating attentiveness and genuinely appeared to enjoy the lesson (Sh.soci.lo, 15 September 2010). Although the lesson was mainly lecture-based, interaction through the Q&As and class discussions prompted the students to discuss, ask questions, share their views, and voice opinions rather than merely recounting or reciting memorised facts and details. At the same time, the lecturer was an active participant, listening, asking probing questions, and encouraging students to respond. Her behaviour generated an environment conducive to learning by setting the expectations and a high motivational climate for the students in the class. The students' *In-Lesson Questionnaire* corroborated the observation findings:

- *Jolly lecturer always. Leaves the topic for discussion to*

floor/students and she also participates, accepts opinions. Her mood and class/teaching are always compatible to us;

- *The lesson was interesting as it encouraged us to participate and share our view or raise our opinions; and*
- *The lesson ... provided opportunities for class participation* (Sh.soci.lq, 15 September 2010).

The comments in the *In-Lesson Questionnaire* also confirmed that the lesson observed was typical of the lessons with this lecturer:

- *The lesson taught was similar to the previous class, as the lesson was clear, well organised and provided opportunities for class participation;*
- *She always comes prepared and as usual encourages 100% class participation and respects our opinions;* and
- *It's all similar techniques that was used in previous classes. The atmosphere is very open where we can raise our opinions, views and examples* (Sh.soci.lq, 15 September 2010).

The overwhelming responses on the typicality of the lesson, as being lively, interactive and friendly manner confirmed that the lesson was not prepared for observation but was the usual practice.

In the lesson *The Way of the World,* the lecturer followed a similar pattern as the Sociology lesson, but was unable to create a comparably positive environment for learning. In fact the students were the same as those in the Sociology class, but were quite reticent in the class. Although there were additional small activities such as reading and group discussion that were intellectually stimulating following the Q&As, the rapport that the Sociology lecturer shared with the class was absent. The lecturer, while explaining and asking questions, remained seated. Most students did not make any attempt to respond, but they listened and wrote notes. The lecturer did not make extra efforts to encourage them, and was engrossed in the lesson explanation. Comments in the *In-Lesson Questionnaire* by the students confirmed the observation findings:

- *She should be active while teaching. Sitting alone on a chair makes the class atmosphere monotonous;*
- *It would be better if sometimes we are made to do group*

discussion; and

- *We are contended contented* [sic] *with her teaching but it could be better if she slowed her pace of teaching a little* (Sh.engh.lq, 15 September 2010).

Student responses indicate that the issue of too much content and the quick pace of the lesson were deterrents to creation of an environment conducive to student learning, as they felt rushed. Comments such as:

- *She always allows the students to participate*; and
- *In the class, she asks questions and discusses, explains, asks opinions* (Sh.engh.lq, 15 September 2010).

however indicate that the lecturer engaged some of the students in the lesson. The comment also confirmed the typicality of the lesson with other lessons given by the lecturer. Therefore although the lesson presented opportunities for active learning for some, the level of learning conduciveness was not very high as the lecturer was engrossed in teaching and focussed on completing the topic.

The *Borohydrides* lesson had a comparatively active 'cognitive space' created but it was unlike the one seen in the *Social interactions in everyday life* lesson. In this session, the lecturer used a rather closely-controlled strategy to hold the students' attention by asking questions during his teaching. He did not only allow the ones who raised their hands to answer, but selected any of the students to answer. This automatically kept the students attentive, and involved in the lesson. He was also very vigilant. He was aware of the students sitting at the back of the classroom and moved around the class while explaining and rather than standing at the front of the room. When he caught a student not paying attention, but looking out of the window, he directed the student's attention back to the lesson (Sh.chem.lo, 14 September 2010). However, the learning environment was controlled as the students were compelled to pay attention to the lecturer. Perhaps they were not intrinsically motivated but rather compelled to do so by the firm classroom management strategies of the lecturer. However, students in the *In-Lesson Questionnaire* commented on this aspect of the lecturer as well as appreciated the manner in which he conducted his class:

- *He is really concerned about the learning of the students and he is really disciplined in the class* (Sh.chem.lq, 13 September 2010).

On the other hand in the *Pollen Germination* lesson the lecturer's relaxed and confident manner, together with the fact that it was a science practical lesson, created an environment that was fairly conducive to learning, as the students received clear instructions about what and how to conduct the experiment. The atmosphere was supportive, with both the lecturer and the laboratory assistant available for clarification of content and assistance with the apparatus or material respectively (Sh.botn,lo, 16 September 2010). Students in the *In-Lesson Questionnaire* commented on this aspect of the lecture:

- *The lesson is perfect and the tutor seems to be more eager to teach us* (Sh.botn.lq, 16 September 2010).

The lecturer's eagerness transformed the cognitive space for the students, thus creating a fairly conducive learning space.

Apart from these examples of lecturers' roles in the creation of an atmosphere to learning, the atmosphere in the lessons, *Application of Trigonometric Theta*, *Functions (Programing Fundamentals*, *Government Budgeting with reference to India* and *Jainism* was less so. The lecturers were far too engrossed in their content-intensive teaching and did not spend time creating a stimulating learning environment.

Encourages students to accept responsibility for their own learning and accommodates the diverse learning needs of all learners

The closest example to this indicator was observed in *The Way of the World* lesson in which the lecturer put the responsibility for their learning on the students. They were directed to read the text before the lesson, a direction that was repeatedly emphasised by the lecturer throughout the lesson. Only if the students had read the text could they participate in the lesson. Comments in the *In-Lesson Questionnaire* confirmed this particular characteristic of the lecturer:

- *Our lecturer always asks us to read the text before we come for the class;* and
- *Today was no exception as she always asks us to read the text in advance and once in class, she asks questions etc.* (Sh.engh.lq, 15 September 2010).

In the other lessons, there were few opportunities beyond listening, writing notes, and responding to questions, for students to take responsibility for their own learning as 'lecturing' was the main approach to teaching and learning. As mentioned earlier in the *Application of Trigonometric Theta* and *Functions (Programming Fundamentals)* lessons, students were given no responsibility solving - or for writing the functions of a simple programme. Instead the lecturers simultaneously worked with the students. Extensive explanation and 'teaching' took place throughout the lessons. For the *Application of Trigonometric Theta* lesson students commented on the need to allow them participate in group activities, do classwork thereby taking some responsibility for their learning (Appendix 4.4.5).

Accommodating the diverse needs of the learners was not considered in any of the eight lessons. All students were treated in the same manner, with differing learning needs not taken into account.

Demonstrates an understanding and in-depth knowledge of content and maintains an ability to convey the content to students

The eight lecturers demonstrated considerable knowledge and in-depth understanding of the content of the lessons they taught. They demonstrated confidence when explaining the content, demonstrating examples and responding to the rare questions asked by students. However, it was observed across the lessons that conveying content to the students was not done effectively. For example some of the lecturers did not exhibit effective questioning techniques. Questions mostly tapped into lower cognitive levels, and appeared to be those that came to their mind during teaching. Well thought-out questions, around which the other questions could scaffold themselves, were conspicuously absent (exceptions *The Way of the World*, Trigonometric and Sociology lessons). The majority of the lecturers used the conventional 'lecture' format, and few made efforts to create a stimulating

environment. It was very obvious that little attention was given to the importance of pedagogy. In fact one academic commented that the *teaching skills and strategies* learnt were not utilised as there was a lot of content to cover and therefore the lecturers used the conventional lecture method most of the time (Sh.fld.nt, 11- 18 September 2010).

The data indicated that the roles played by lecturers in the College were largely teacher-centred as the lecturers see themselves as knowledge experts, transmitting knowledge to the students. Nevertheless in some lessons attempts were made to make their lessons active, and to promote deep learning in students.

Role of the Student

The role of the students is examined using the indicators identified in Chapter Two.

Accepts responsibility for their own learning

For the most part, students were observed to be passive in the lessons. They did not appear to take initiatives that would indicate that they accepted responsibility for their learning. They listened to the lecturers explaining, made notes and responded only when questioned. Although the lecturer in *The Way of the World* lesson made a concerted effort to make students responsible for their learning, it was not wholly successful as demonstrated by the number of students who responded to her questions and engaged in the discussion. As noted in the lesson observation record for *The Way of the World* lesson '*Two students take turns to respond describing the events and characters*' (Sh.engh.lo, 15 September 2010).

The passivity of the students was further demonstrated in the note-taking episode in the *Government Budgeting with reference to India* lesson: the students asked the lecturer to give them time to copy the slides of his PowerPoint presentation and the lecturer complied (Sh.econ.lo, 13 September 2010). This kind of behaviour showed the dependency of the students on the lecturers, and was evident in most of the lessons, including *Functions on Programming Fundamentals, Application of Trigonometric Theta, Borohydrides*, and *Jainism* in which students exhibited low

self-confidence, with many copying word-for-word what the lecturers wrote or presented on PowerPoint slides.

These behaviours showed that students were largely passive learners and that they did not take responsibility for their learning. Rather they followed the directions given by the lecturers and responded to questions when they were asked. There were few examples except in the *Social interactions in everyday life* and *Jainism* lessons, of students asking lecturers questions.

Actively participates in the class

For the most part students were observed to be passive in classes, so the level of active participation in the eight lessons observed was not very high. The lesson in which the students actively participated most was the *Pollen Germination* practical session. They worked at their workstations, discussed class content with each other, and sought help from both the lecturer and the laboratory assistant when they required it (Sh.botn.lo, 16 September 2010).

When lecturing was the predominant strategy, not much opportunity was presented for students to participate actively in the class. An exception to this was in the *Social interaction in everyday life* lesson (Sh.soci.lo, 15 September 2010) in which students were provided with opportunity to participate in the class discussions, respond and ask questions. Students in the English lesson *The Way of the World* were fairly active in the class, responding to questions and participating in the class discussion (Sh.engh.lo, 15 September 2010), but their level of participation was lower than that of students in the Sociology lesson.

Some level of participation was observed in the Chemistry lesson on *Borohydrides* and the History lesson *Jainism* in which students were drawn by the lecturer during the demonstration or explanation (see Appendix 4.3 on Lesson Observation Records of the lessons for further details). Conversely in the *Application to Trigonometric Theta, Functions on Programming Fundamentals*' and *Government Budgeting with reference to India* lessons, students did not actively participate in the class responding only occasionally to the questions, but mostly copied from the

board work or the PowerPoint slides. Consequently, other than active listening, taking notes and responding to questions, students did not do much in these lessons.

Collaborates/teams with other students

There was little opportunity provided to students to collaborate or work in teams with other students. There were two lessons where students were provided opportunities to collaborate with other students. One such opportunity was in the English lesson where students were required in small groups to discuss the meaning of a '*Song set by Mr. John Eccles'* in the play *The Way of the World* and share with the class (Sh.engh.lo, 15 September 2010). The second opportunity was in the *Pollen Germination* lesson where students worked individually on the experiments and consulted with each other on their own initiative (Sh.botn.lo, 16 September 2010).

The data showed that few students were actively involved in their learning as lecturing with the added customary questioning was commonly used.

Summary

The preceding section addressed the question "*How do the lecturers implement their prepared plans in a way that supports student learning?*" The behaviour of the lecturers in the College indicated the belief that they are the knowledge providers in classrooms. Based on this view, implementation practices of lecturers were largely teacher-centred, with transmission of knowledge through lecturing used in conjunction with Q&As, demonstrations and class discussions. However the data showed that class discussions and interactions were dependent to a large extent to the personality of the lecturer, which was adequately demonstrated by the Sociology lecturer's conduct, and the impact on students' participation and therefore learning.

The other lessons exemplified more typical patterns of lecturer-dominated teaching, with small episodes of student participation being promoted. The trend towards 'teaching the subject' was prevalent as the lecturers had sound content foundations and were confident of their subject's knowledge.

Evaluation

The final section of the case study evaluates the planning, implementation and assessment practices of the lecturers to answer the research question: "*To what extent do the planning, implementation and evaluation practices of the lecturers support student learning?"*

Analysis focuses mainly on two issues: i) the congruence between what was planned for each lesson, as described in the Planning section, and what was actually implemented in the lessons, and ii) the extent to which the Planning, Implementation and Evaluation that occurred in the lessons supported students learning vis-á-vis the seven categories identified in the analytical framework.

Learning Outcomes

As explained above, the discussion focuses on two issues. However it is pertinent to comment initially on the construction of the LOs as these comments provide further insights.

Construction of Learning outcomes

One of the key findings about the learning outcomes planned by lecturers was the focus on subject content (emphasising knowledge enhancement) together with a few LOs in the personal-generic category (Table 4.1). There were also inconsistent practices in the framing of LOs using the SMART criteria. The LOs for the lessons demonstrated a general and significant lack of understanding of how to frame LOs. A further finding is that application of the revised Bloom's levels of thinking to the LOs revealed that 60% of the LOs were in the lower levels than at the higher levels (Table 8.3 in Appendix 8.1).

In terms of the contentious issue of levels of thinking evident in LOs, as argued in the Literature Chapter by Maher (2004) and Hussey and Smith (2002) that cognitive development is not linear and the pattern of learning and skills appropriate for different levels need to be subject-specific, varying from subject to subject. While it is good to promote higher levels of thinking in students, the unquestioned acceptance of the idea

of ‘high’ and ‘low’ levels of thinking has led to misinterpretation in the use of Bloom’s levels of thinking according to Kagan (2011). In most subjects, the foundation knowledge and comprehension requirements need to be achieved before higher-order thinking skills. This is demonstrated in the LOs for the *Functions (Programming Fundamentals)* lesson. Further Orlich, Harder, Callehan, Trevisan, and Brown (2004) describe the revised Bloom’s Taxonomy as hierarchical: “Deeper understanding would be reflected in the next-higher level of the taxonomy” (Bloom et al., 1956, p. 2). Therefore the use of ‘lower’ order thinking skills in LOs did not necessarily mean that they were ineffective because they were equally important in students’ learning.

Other features that emerge from the LOs illustrate the discrepancies in their framing. LOs, such as those for the Sociology lesson *Social Interactions in everyday life* indicate that little consideration was given to their articulation because *Understand the topic well* and *Understand the concepts related to the topic* are, in essence, the same (Sh.soci.lo, 15 September 2010). Additionally, in the English lesson *The Way of the World*, the LO was a bundled statement combining two outcomes *Discuss* and *Relate* which were difficult to assess separately. The LOs for the History lesson *Jainism*, *Give* [a] *moral lesson so that students will be disciplined* and *Give ideas to help shape the students’ lives* did not sit well with the SMART criteria used to assess them. Apart from the technicality of writing LOs, these LOs were based on emotional content of learning rather than effective lesson outcomes.

It could be construed from the findings that the absence of, or inadequately constructed LOs impacted on the lessons in some but not similar ways. For example, LOs for the *Jainism* lesson were a mixture of all sorts of discussions on religion rather than on the lesson topic (Sh.hist.lo.13 September 2010). Because the LOs were poorly constructed, they did not guide the lecturer or the lesson. On the other hand, although the LOs in the *Social interactions in everyday life* lesson were also inadequately constructed, it was observed that the lesson was effective, and student learning took place. The personal qualities of the lecturer created an environment conducive to learning may explain the difference outcomes. In this study, this was, however, an exceptional example. Kennedy et al. (2006) assert that the chief

advantage of LOs is the clarity and precision they can bring to learning from the perspectives of the learner, teacher and employer. Nevertheless, the play of other factors must be considered, as they too have a powerful effect on creating an environment conducive to learning – such as that observed in the Sociology lesson.

Congruency of LOs

In spite of the inconsistencies in the design and construction of LOs, there was a general congruency between what was planned and what was implemented. While the proposed LOs were followed and implemented as planned, unplanned 'hidden' LOs of the personal generic type too guided the lessons and they were not focussed on the content of the lesson.

For example the hidden LOs in *The Way of the World* lessons as described in the Implementation phase emphasised that the students should assume responsibility for their learning and on study skills. Several students in the In-Lesson Questionnaire commented on the expectation of the lecture that the students read the text before the lesson (Appendix 4.4.7). It was evident from the students' comments that this was the 'norm' for that lecturer. However, as the lecturer had not communicated this LO in the pre-conference interview, therefore for me as an observer, it appeared as a hidden LO in the lesson.

Unplanned LO's for the *Social interactions in everyday life*, *Pollen Germination, Government Budgeting with reference to India* and *Borohydrides* lessons focused on the importance of creating an environment conducive to learning. These LOs had potential long-term benefits for students and this enhanced the lessons positively even though they were not immediately visible. For example in the Chemistry *Borohydrides* lesson, the unplanned LOs focussed on the learning environment in that the lecturer was very vigilant and students could not escape his watchfulness and had to listen and be with the class. He kept the students on their toes by asking questions, especially to students who had drifted off from the lesson. He was also very aware of the students sitting at the back of the room and moved around the class while teaching (Sh.chem.lo, 14 September 2010). However, since it

was enforced, the atmosphere could be described as rather 'disciplined'. The students in the *In-Lesson Questionnaire*, however, appreciated the efforts of the lecturer to involve them all in the lesson (Appendix 4.4.3).

On the other hand, certain types of the lecturers' behaviour inadvertently they reinforced certain kinds of behaviour among the students who were overlooked in the lesson. The Maths lecturer did not look at the students, but was engrossed in his teaching (Sh.math.lo, 14 September 2010). This could suggest indifference and teaching in a mechanical way. In the Computer Science lesson, the lecturer concentrated on the students on the front rows and was apparently unaware of some students quietly sleeping at the back of the room, while some looked anxious as they could not hear the softly-spoken lecturer from the back of the room (Sh.comp.lo, 14 September 2010). The *In-Lesson Questionnaire* produced these comments about these behaviours:

<u>Computer Science Lesson</u>

- *She leaves us to ourselves;*
- *Because class was dull, all the students were in their own world;* and
- *Her voice is not clear and audible in the back* (Sh.comp.lq, 14 September 2010).

<u>Mathematics Lesson</u>

- *Since we are large number of students it is very difficult to accommodate and students at the back are facing problem to see the board writing;*
- *It would be better if sir use the bold marker pen with bold handwriting for everyone's visibility;* and
- *He never looks at students when he lectures* (Sh.math.lq, 14 September 2010).

These comments hinted at the classroom environment that was not very conducive to learning. These hidden LOs unmistakably present in the lessons influenced the general learning environment of the class.

The situation in the *History of India* lesson, was quite different and to a certain extent, complicated the analysis. The LOs communicated by the lecturer were

about helping students to lead better lives (Sh.hist.lo, 13 September 2010). During the lesson, although he made reference to various topics and presented a rich selection of ideas for the students to consider, they were not specifically related to *Jainism.* These apparently unplanned LOs did not have the same impact on student learning as in the previous effective examples.

In summary besides the planned and intended LOs, there were some unplanned and unintended LOs being addressed in the implementation of the lessons. The planned LOs were subject specific while the hidden unplanned LOs were of the personal-generic type. The positive unintended LOs indicated characteristics of student-centeredness. The findings presented a mixed picture of the different aspects that influenced student learning in the eight lessons. While some were favourable and enhanced learning, others were neither desirable nor supportive of student learning.

Alignment of LOs with teaching- learning and assessment

Evaluation of the alignment of the LOs in the eight lessons with the teaching and learning approaches and assessment was done with a view to ascertaining whether the lessons were so planned (oral and written) that learning activities and assessment were aligned with them. Advocates of good alignment claim that it facilitates deep learning (Biggs, 1999) and can support learner-centeredness (O'Connell, 2010).

Analysis of data collected during the Planning, Implementation and Evaluation phases, showed that the LOs were only partially aligned in the eight lessons. The LOs for the lessons were only sometimes clear, and misrepresented the expectations and rigour essential for learning with realistic methods for assessment. An example of an extremely inefficient case in point of alignment is the lesson on *Jainism*. The LOs were not aligned to the teaching and learning approach or to the assessment. Implementation of the LOs was not effective as they were impractical and unrelated to the actual module LOs. Perhaps lecturing was a suitable method but assessment would be problematic. Although questions (as part of informal formative

assessment) were used, they were philosophical and rhetorical in nature. Also to a certain extent they were perfunctory, as the lecturer did not give students time to think and answer before continuing with, *We don't have time* or *Let's get back to our topic* (Sh.hist.lo, 13 September 2010). The lesson was intense with teacher talk which did not permit time for students to interact with the content on their own, or discuss issues with each other, or even to construct their own meaning of what was being taught. Learning was confined primarily to listening and therefore it is clear that alignment did not take place in the lesson, as the LOs did not provide clear directions for the teaching-learning and assessment.

On the other hand an example of a comparatively better-aligned lesson was the *Pollen Germination* practical lesson for which the lecturer used individual activity as the teaching and learning approach. While monitoring the students working on their experiment, the lecturer provided informal formative assessment and at the close of the lesson, the lecturer did a summative assessment of the students' work by marking it. He also gave them oral feedback on the work (Sh.botn.lo, 16 September 2010). Activity-based learning and both formative and summative assessments in the lesson indicated that they were clearly aligned with the LOs.

Levels of alignment between LOs and their implementation in other six lessons fell between these two examples. In the *The Way of the World* lesson, the lecturer used the 'lecture' method combined with Q&As, brief reading activity and group discussions, which required that students take responsibility in their learning. The questions and activities were used as teaching strategies, to assess student learning, thus establishing an alignment of the LOs with the teaching and learning approach and assessment in the lesson. Similar effects were seen in the *Social interactions in everyday life* lesson, which centred on Q&As and class discussion. In lessons such as *Borohydrides, Functions (Programming Fundamentals), Application of Trigonometric Theta,* and *Government Budgeting with reference to India* in which the lecture was used as the predominant teaching approach, with brief moments of demonstrations and guided problem/programme writing, the alignment was not clear,

particularly because 'lecturing' did not allow students to explore learning on their own. It was also quite difficult to ascertain whether the assessment supported student learning.

In summary, the lessons did not represent the best practices of alignment. The strong content focus in the College also influenced the way the lessons were organised with transmission generally considered as best way to pass on knowledge from the lecturer to the students. Thus congruency and alignment were not fully achieved through the LOs in all the lessons. Since the College offers general degrees, most of the lecturers were not trained teachers but subject specialists, which probably explained why there was so much focus on the content and the lecture.

Teaching and Learning Approaches

In the following section, the congruence between the planned and implemented teaching and learning approaches is evaluated to find out to what extent student learning was supported in the lessons.

The statement in the *Introduction to Sociology* module plan '*Lecture will be the main approach used to teach the module*' (Sh.soci.mp, July – December 2010) is testimony to the espoused approach to teaching and learning in the College. Frieson (2011) noted that the lecture remains an important way to communicate large amounts of information to many students, adding that teacher control is maximised, and lectures are non-threatening for students. An informal discussion with a lecturer who had teacher-training, suggested the thinking of the lecturers towards lecture-based teaching:

> - *We don't use what we have learnt in Samtse* [the teaching skills and strategies modules in the PGCE course at Samtse College of Education] *as teaching here is mostly to do with content teaching where lecture best serves the purpose* (Sh.fld.nt, 11-18 September 2010).

However, approximately 20% of the lecturers in Sherubtse College completed the Post Graduate Certificate in Education and were therefore trained teachers (Sherubtse College, 2010). Although small in number, the majority of them

hold responsible positions as Heads of Departments and could make a difference to the teaching and learning approaches in the College. The principles learned at Samtse College had clearly been put to one side. Laurillard (2002) asserts that 'lecture' comes first in the categories of the transmission of education for its non-interactive, linear presentational mode, and that it is not an active way of engaging students in the classroom. It assumes an unrealistic level of students' understanding and comprehension, and often disengages students from the learning process causing information to be quickly forgotten (Revell & Wainwright, 2009). This may explain the problem of the 'disengaging' nature of many lessons, which are evident from the students' observations:

- *We don't get to participate in the class activities frequently. It is just a spoon-feeding class that I have been attending;*
- *If sir could give us group works, more interaction. I think it will be much helpful for us;*
- *It would be nice if sir could make the class to interact with each other, and … it seems there is not much interactions among students and teacher, so, what I think is Sir, need to ask questions* [sic] (Sh.maths.lq, 14 September 2010); and
- *She should ask questions in the middle of the lesson so that students can actively participate in the discussion* (Sh. comp.lq, 14 September 2010).

Not all lectures were completely 'conventional' as they were interactive in some ways although they lacked substantial engagement. Examples were seen in the *Application of Trigonometric Theta*, *Borohydrides, Functions (Programming Fundamentals)* lessons although the lecturer demonstrated procedures and asked questions of the students where appropriate, active engagement was effectively insignificant.

On the other hand, in the *Social interactions in everyday life* and the *The Way of the World* and *Pollen Germination* lessons engaged the students more effectively the lesson as described in the preceding phases.

The two conventional lecture-based lessons *Government Budgeting with*

reference to India and *Jainism* were largely devoted to information dissemination with forty minutes (out of the one-hour lesson period for the *Government Budgeting with reference to India* lesson), and fifty minutes (out of the one-hour) *Jainism* lecture devoted to lecture. In both the lessons there were no activities other than students listening. The students did not even make their own notes but copied the PowerPoint slides word-for-word in the former lesson. Interestingly despite the relatively low level of learning that took place in the Jainism lesson, students gave good reviews such as:

- *Sir is teaching with action, good communication; make us to debate and discussion and questioning;* [sic], and
- *He makes us participate that makes our thinking power excellent;* (Sh.hist.lq, 13 September 2010).

It is apparent from the above comments that students seemed to like the lecturer's teaching. In the *In-Lesson Questionnaire* 62% of the students also rated him 'high' for encouraging classroom interaction and allowing them to work in groups (Sh.hist.lq, 13 September 2010). This presented an interesting paradox because observation of the lesson did not reveal what was attributed to him by the students.

With reference to whether the proposed teaching and learning approaches were actually implemented in the lessons, although most of the lecturers intended to use 'lecture', additional activities transformed them as 'interactive lectures'. For instance in the *Functions (Programming Fundamentals)* lesson, the lecturer used demonstrations to show examples of the procedures for writing a simple programme, followed by guided practice with the students (Sh.comp.lo, 14 September 2010). Similar patterns were observed in the *Application of Trigonometric Theta* lesson in which the lecturer used demonstration and a brief guided practice (Sh.math.lo, 14 September 2010). The same procedures were observed during the implementation of unplanned teaching and learning approaches in the *Borohydrides* and *Jainism* lessons. Additional activities were also observed in the *The way of the World* lesson although during the pre-conference interview, the lecturer advised that she intended to include Q&As and class discussion. But during the lesson, additional activities

such as reading and group discussion were carried out too. Although these activities were not the focus of the lessons, they no doubt enhanced the effectiveness of them, and in some ways promoted student learning.

Thus amidst such an interesting array of analyses, what has become apparent is the existence of a broad variation in the ways the lecture method was used by the lecturers in the College. While some used the 'lecture' in its conventional mode, promoting a surface approach to learning, other lecturers made the lecture interactive, and thus encouraging some form of deep learning. Although three lecturers did this successfully, the other five were not very adept at incorporating components, such as demonstrations, Q&As and discussions that emerged during the course of the 'lecture' to effectively promote student learning. While two lessons (*Jainism* and *Government Budgeting)* were strongly teacher-focused, there were other lessons that were in-between, with some good practices and some with a combination approach which promoted modest levels of deep learning. In summary, there was some congruency between what was planned as some of the lecturers actually provided more activities than included in the plans mentioned before class.

Content Knowledge

In this section the congruency between content planned and actually implemented in the lessons is examined to ascertain to what extent they enhanced student learning. While it may be difficult to evaluate the efficacy of content in each of the eight lessons, some general comments are made on the influence of content knowledge on student learning as observed by the researcher. Content was one of the strengths in the repertoire of qualities exhibited by the lecturers whose lessons were observed, as most of the proposed LOs were subject-specific (Table 4.1).

A major observation made during data collection is that the coverage of content knowledge in the eight lessons was fairly comprehensive as the lecturers were subject specialists, with the required qualifications (Sherubtse College, 2010). However, as discussed earlier, the History lesson on *Jainism*, although a rather interesting lesson, did not focus on the lesson content as planned (Sh.hist.lo, 13 September 2010).

In the *In-Lesson questionnaires* students commented on the relevance of the content. For instance, for the Economics lesson on *Government Budgeting with reference to India*, student comments include:

- *This lesson is not relevant to the Bhutanese context;* and
- *I think this module is job-oriented, so more is needed to have human resources specialised economics for mathematical treatment of the module* [sic] (Sh.econ.lq, 13 September 2010).

Both of these comments pointed to the need to make the content relevant to students' learning and work requirements in Bhutan as the lesson topic was based on information *with reference to India* and its relevance to Bhutan not explained (although the budget-making principles may be the same).

In relation to the *Pollen Germination,* lesson students also made very pointed remarks, such as:

- *Should focus in advanced studies rather than adhering to 1960's information;* and
- *Those chapters which have minimum applicability in Bhutanese society should be replaced with other relevant chapters* (Sh.botn.lq, 16 September 2010).

Given that the lecturer had been teaching the in the college for approximately 20 odd years and had perhaps taught the practical experiment, the comments from the students were perhaps plausible. Perhaps more appropriate topics could be included in the syllabus to make them related to the present day context and requirements.

The strong content focus in the lessons reflected the content of the module plans, and incorporation of different levels of complexity in the content. For instance the broad aims of the Year 1 Sociology module plan for *Bhutanese Society, culture and economy (Introduction to Sociology)* included *Students in the Programme will initially be acquainted with the primary theoretical frameworks and concepts used by sociologists to interpret social phenomena* (see Appendix 4.2.7 for details). Correspondingly the content topics were introductory such as *The Foundations of Sociology* and *Foundations of Society*. Positive comments from the students

supported the relevance of the module content with reference to the lesson:

- *This lesson is interesting as it deals with the society around us*;
- *The class is always interesting with a new thing to learn each day;* and
- *She teaches us up to our expectation* (Sh.soci.lq, 15 Sept 2010).

This clearly implied that student learning was well supported through the content knowledge of the lecturer as well as the manner in which she conducted the lesson. Similarly, the module plan for Year 3 Mathematics *Discrete Structures* included *Students undertaking this course should be able to articulate in-depth understanding of core knowledge on completion of the course* (Appendix 4.2.5). Topics such as *Generating functions* and *Combinatorial Problems* and *Linear recurrence relation with constant coefficients in Discrete Structure* implied complex levels of content. Similar patterns were observed in the other subject module plans, with the content becoming more complex at each level. The content competence of the lecturer was indicated by students' comments in the *In-Lesson Questionnaire* in delivering the lesson and its relevance*:*

- *He has a lot of professional knowledge;* and
- *Truly speaking I really like this lesson because he teaches us very well and we enjoy learning maths and solving big, big questions* (Sh.math.lq, 14 September 2010).

Content knowledge is important in a teacher's repertoire of teaching skills (D. L. Ball, Thames, & Phelps, 2008; Colander, 2004). However, it is also important to know is how the teachers' content knowledge supports students' learning. According to Shulman (1986), it is not sufficient for teachers to know a subject well; they need to be able to teach the content knowledge and knowing a subject for teaching requires more than knowing its facts and concepts. As the 'lecture' was the dominant model of teaching in seven of the eight lessons, opportunities to use other learning approaches were neglected, perhaps due to the absence of formal teaching qualifications in lecturers. However, three of the eight lecturers had undertaken formal postgraduate certificates in teacher-training so they should have been aware

of the significance of pedagogical content knowledge in teaching. But there may be an alternative explanation. During an informal conversation, one lecturer commented that *the syllabus is heavy and cannot be covered using activities* (Sh.fld.nt, 13 September 2010). The *heavy syllabus* alluded to the RUB-endorsed programmes, which when taught under the auspices of the University of Delhi, these topics were spread over two semesters and taught over a year, but they are now taught in a single semester. This changeover in the programme structure and size of modules took place when Sherubtse College became a part of RUB and new academic credit regulations, different from the Delhi University ones were applied, putting pressure on lecturers who are taking time to come to grips with the changes (Sh.fld.nt, Sept 2010).

Although the eight lessons described the required content knowledge and skills that students need to learn in order to complete the course, the relevance and the currency of the content was not considered applicable in some lessons as understood by a comment in the *In-Lesson Questionnaire*. This was as the job market was competitive for the students:

> - *Overall this module is scientific and good learning takes place but it does not help us to prepare for the Royal Civil Service commission exams which we have to take with general BA graduates, as it keeps us so busy most of the time* (Sh.botn.lq, 16 September 2010).

Upon completion of the Bachelors degree, students appear for the Civil Service Examination in order to be eligible for employment in government service, which is the most coveted form of employment for the graduates. The Bachelors degree would give them the competitive edge necessary for employment, but as commented by the students, the content needed to be current, useful and relevant to the job market.

Based on the preceding deliberations it seems that the content knowledge was, to a considerable degree, congruent with what was planned and implemented and supported student learning fairly well. However, the feedback from the students should be taken into account to make the content much more relevant, realistic and

current to the requirements of the students in the College. Lack of relevancy and currency are serious criticisms.

Assessment

This section examines congruency between the assessments that were planned and what was actually implemented in the eight lessons and evaluates the extent to which the assessment supported student learning.

As noted in the Planning, Implementation and Evaluation phases, the most common method used by lecturers to evaluate students' learning was questioning to check understanding and clarify where necessary and assess prior learning, actions that were conducted at different phases of the lesson. Such practices have the potential to directly improve learning prompting student to think through their responses (Ruiz-Primo, 2011), as well as provide timely feedback to increase student learning (Sadler, 1989; Shepard, 2005). Teachers can also make corresponding adjustments to their teaching, leading to significant gains in supporting student learning. Although informal formative assessments were implemented in the lessons during the lesson observations, they were not apparently planned in the lessons. This may simply have been an oversight though the direct benefits of the assessment were undervalued as their potential benefits were not completely realised in the lessons.

In the *The Way of the World* lesson, questioning to assess prior learning as well as promote current learning was used at least partially effectively as an informal formative assessment strategy. Not all of the students, however, were involved. There could be several reasons for this: i) the play was complex, having multiple layers and subtlety which could have been difficult to comprehend; ii) the students had not read the text before the lesson, therefore were not prepared for the Q&As and discussion and iii) most significantly, the lecturer did not make corresponding adjustments in her teaching for the students who did not participate in the lesson, thereby excluding them by their non-participation. Although informal formative assessment took place, it was not utilised effectively for all of the fifteen students.

This pattern of using informal formative assessment was observed in other

lessons too – for example the *Functions (Programming Fundamentals), Application of Trigonometric Theta,* and *Jainism* lessons but it was not efficiently managed. Informal formative assessments were moderately well carried out in the *Social interactions in everyday life*, and *Borohydrides* lessons wherein the lecturers used questioning to check as well as clarify students' understanding of what was being taught. They made minor adjustments to their teaching depending on the students' level of understanding. For example in the *Social interactions in everyday life* lesson, the lecturer shared several examples of the concepts being taught, and asked students to share their experiences of concepts such as *embarrassment* [Appendix 4.3.6). Similarly in the *Pollen Germination* lesson, while monitoring the students during the experiment, the lecturer asked questions, or quietly observed them at work and provided assistance when required (Sh.botn.lo, 16 September 2010).

In summary, lessons in which informal formative assessment was fairly well managed, student learning was supported much more effectively than where it was not efficiently managed. To a certain extent, the LOs guided the assessment practice in the class, but there was an exception. In the *Social interactions in everyday life* lesson, although the LOs were not very clearly developed, informal assessment was well conducted.

Resources

In this section congruence between the resources mentioned in the planning phase and those actually used in the implementation phase is explored. The impact of the use of these resources on student learning is also examined.

In the planning phase, not all the lecturers talked about the resources that would be used in the lessons. Those that were mentioned for use in the lessons were the textbooks (one lesson), the laboratory equipment (one lesson), and PowerPoint presentations (two lessons). LOs for the *Borohydrides* and *Social interactions in everyday life* lessons included references to the chalkboard to be used in conjunction with their lectures to demonstrate the chemical structures and their equations, and to highlight the key points respectively. Correspondingly, in the implementation phase

of the lessons, no additional resources other than the chalkboard were observed.

The use of the textbook in *The Way of the World* lesson was effective, and a good deal of the discussion centred on it. Moreover, as explained earlier, the lecturer used the textbook as a tool to encourage students to take responsibility for their learning. Although the use of textbook was evident in the lesson, the lack of additional references to enhance the textbook was mentioned in strong terms in the *Student Interview*:

- *Get more references especially for English as there are only one or two copies of the books and we are like 52 students* [in a class] *therefore books are not sufficient* (Sh.stu.int.16 September 2010).

Shortage of reference books to support learning in other lessons was also commented by students:

- *The chemical reactions are very complex and confusing with limited books and no particular book for the lesson in the library* (Sh.chem.lq, 14 September, 2010); and
- [We] need *more books pertaining to this subject* [Economics] *and more teaching aids. There is lack of resource (text books) that are given in RUB syllabus* (Sh.econ.lq, 13 September 2010).

The lack of reference works was corroborated by the data collected from the College library. Although it was one of the largest libraries in RUB (35000 volumes and other relevant resources), the librarian voiced concern about the currency of some of the books and materials as most reference books were old especially the ones previously used for the University of Delhi degrees which have now been phased out (Sh.lib.int, 13 September 2010). Moreover with the steady increase in numbers of students and introduction of new programmes in the College, the Library resources require an injection of additional reference books and other related resources (Sh.lib.int, 13 September 2010).

The use of PowerPoint presentations in two lessons provided evidence of the use of technology in the classrooms, but overall the technological resources were underutilised. Linkages with the Internet could have provided relevant and current materials, and short audio or movie clips incorporated into the lessons could have

helped to make the lessons more interactive and stimulating. The PowerPoint presentations in two lessons were used as tools for the purpose of information dissemination. Although used for the same purpose, the lecturer in the *Government Budgeting with reference to India* lesson used it less creatively than the lecturer teaching the *Functions (Programming Fundamentals)* lesson. The PowerPoint presentation in her lesson was used in a much more innovative manner in combination with the whiteboard. This way she enhanced the lesson input with information transfer. This was a simple but creative way of utilising two resources that complemented and enhanced her teaching though one student commented in the *In-Lesson Questionnaire:*

- *The lesson would have been much more interesting if handouts and notes were given before the lesson* (Sh.comp.lq, 14 September 2010).

However the class was large, with 50 students sitting in rows so the resourceful combination of the PowerPoint presentation and the whiteboard may not have been fully appreciated by the students, and thus did not effectively promote their learning. In the *Government Budgeting with reference to India* lesson, the lecturer simply read the slides aloud, and added some explanations to the class. The fact that the students diligently copied the slides, suggested that some benefits may have accrued to the students and that some kind of learning, however passive, was promoted (Sh.econ.lo, 13 September 2010). However, reading slide material is not good practice.

While the chalkboard was used extensively in the *Jainism, Borohydrides,* and *Social interactions in everyday life* lessons, its use as explained earlier was exemplary in the *Application of Trigonometric Theta* lesson. The lecturer used it efficiently; dividing the board into columns and in neat writing presented a well-sequenced developmental framework for the lesson. This was advantageous for the students as the information input was illustrated in a clear logical manner and was clearly motivating because they listened attentively and made notes (Sh.math.lo, 14 September 2010). However, since the class was a large one (55 students), the board work was not appropriately available to all students:

- *Sometimes the words written on the board is invisible to the ones*

sitting far from the board. It would be better if sir use the bold marker pen with bold handwriting for everyone's visibility (Sh.math.lq, 14 September 2010).

In the *Pollen Germination* lesson, the laboratory was well set up and had the required relevant material for the experiment. Unfortunately the number of microscopes was insufficient, so students had to share them during the experiment. Students commented on the problem of inadequate resources in the laboratory:

- *Difficulty in doing practical work because of not equipped material laboratory* [sic] (Sh.botn.lq, 16 September 2010).

Besides the students, the lecturers too were acutely aware of the lack of classroom and subject-related resources, a factor that impacted on their teaching:

- *I am comfortable using the OHP but prefer the LCD for teaching/presenting the content, but since we do not have many LCDs, we have to share among ourselves in the department;*
- *We lack relevant library references, we have many books but particular books are difficult to get;*
- *Getting resources is hindered by the geographical location of the college – they become very expensive and we are very far from the dealers;* and
- *Lack of teaching learning resources like LCD projectors, equipment for the Survey Module – most of the equipment are very old and some are not available* (Sh. aca.int, 16 Sept 2010).

In such a setting the lack of resources limited opportunities for students' learning. Nevertheless, with the development and expansion of Information Technology facilities, the College had five student browsing computer laboratories with 25 computers each making Internet access to available to the students. The College ICT officer, however, pointed out that the College has more than 1000 students and more than 100 lecturers, so the use of the Internet was very high. The College Internet bandwidth was 4 mbps, which had only recently been upgraded from 2mbps (Sh.ict.int, 13 Sept 2010) and remained inadequate. With the use of the Internet resources extending the information base for students, care should be taken to check the validity of sources. Dependence on textbooks is an issue that also needs attention because many needed to be updated.

Further, the physical setting of the classrooms impacted on the quality of learning. Crowding rooms with little or no place to move around, constrained the lecturer's movement and therefore interaction. Lecturers in both the Computer Science and Mathematics lessons kept to the front of the cramped room and interacted mainly with the students in the first two rows. However, a larger-sized classroom may not be always be advantageous to the lecturer. In the *The Way of the World* lesson, the lecturer sat on a chair in a large space.

In a similar fashion, the Sociology lecturer too stood at the front and taught, but the similarity ended here. The manner in which she interacted with the students, drawing out to the students, making them feel at ease, encouraging them to answer or share ideas made the learners active and the class very lively. This exemplified a case wherein the attitude of a teacher made an enormous difference to the learning environment irrespective of the room size.

An academic staff member aptly described the resource scenario in the College:

- *To me resources are very important because currently we have new syllabus, new curriculum, we face* [a] *problem getting references even* [of] *a single one for some modules* (Sh.aca.int, 15 September 2010).

Thus resources supported student learning only in a modest way. The linear manner in which they were planned and implemented could be improved and expanded to include more, and more varied resources. The potential offered by technology as an effective tool requires exploration both inside the classrooms and beyond them in order to create an environment that facilitates more active, deep and student-centred teaching and learning.

Role of the Teacher

The role of the teacher in the Planning phase is considered as the curriculum, module developer, and the resource organisers. Their responsibilities include planning, deciding the content of the modules in consultation with experts, writing the modules and arranging for the resources to support them. In the Implementation

phase, the lecturers essentially acted as information providers in most of the lessons, facilitators in a few lessons and as assessors of student learning in the lessons. The lecturer's comment about not using a range of pedagogical strategies because there was too much content to teach reflected a belief in the importance of the role of information transmitter.

Observation of the eight lessons revealed that the lecturers essentially demonstrated a combination of teacher-centred and student-centred strategies throughout their lessons. In some they employed teacher-centred strategies providing content knowledge, demonstrating examples of procedures, the application of mathematical principles or atomic structures and chemical equations. In others they created environment conducive to learning, encouraging student participation in the lessons. Several comments from students in the *In-Lesson Questionnaires* of the eight lessons provide a sense appreciation of the approaches used by lecturers as well as criticism where student learning was not effectively supported (Appendix 4.4).

Correspondingly, the lecturers explained the difficulties they faced while teaching and why they could not use more active learning approaches:

- *I would like to use more interactive teaching, demo teaching and give hands on practice to the students as currently due to large number of students, some do not get opportunity to perform the practicals – equal opportunity is difficult to maintain;*
- *Initially students are bit reluctant as we make them understand, they become open and accept and when I give them assignments, they organise by themselves and submit. … No one remains absent; they take initiatives, become more independent, and solve minor problems by themselves or in groups. But we need to give them proper directions and guidance;* and
- *Students are taught in passive learning style and once we ask them to learn things on their own and explore, they find it difficult* (Sh.aca.int, 15 September 2010).

From these comments it is evident that many of the lecturers were aware that they should use more active teaching and learning approaches but were constrained by the limited resources and increasing number of students at the College. They also appreciated the difficulties that students initially faced when asked to learn on their

own, as the students were not familiar with active learning and required guidance from the lecturers. Thus the lecturers believed they were confined in the role that they could play.

The lecturers were also keen to encourage student–centred learning in their classrooms and promote active and deep learning in the classrooms but with caution:

- *I still want to make it more student-centred like letting the students explore and find out new ways of putting ideas across to the students. Plus I want what I teach to be applicable to life and not simply book knowledge;* and
- *The methods* [in the Western models of teaching and learning] *help our students to analyse, to be critical thinkers, but the problem we have here in is we are learning in a 2nd language so there will be problems with expressions, cultures. English language can be a demotivating factor for students as they will not be able to express their learning experiences in a second language* (Sh.aca.int1, 15 September 2010).

The comments highlight pertinent issues of compatibility of the language and culture to accommodate student-centred, active and deep learning approaches in the College classrooms.

This, as well as the problems with increasing student numbers, and inadequate resources to support learning may help to explain some of the difficulties experienced by lecturers in their attempts to employ student-centred teaching methods in the classrooms. It may be significant that none of the lecturers mentioned the importance of examinations and the work involved grading them.

Some of the lecturers scheduled in student consultation hours and included that information in the module plans, such as those for Mathematics, Computer Science, and English modules (see Appendix 4.2, p 461 for details). This inclusion of the lecturers' consultation hours into module plans reflects their concern for, and professional attitude towards the students. This could also provide students with opportunities to discuss and clarify matters if concern to them.

When asked to describe the roles of lecturers in the class, the students gave the following descriptions based on their experiences with the different lecturers.

They saw the lectures as both facilitators and the content transmitters as seen in the description, especially the first one:

- *The main role of the lecturer should be to pass on subject knowledge and help us to develop skills to go on learning;*
- *Encourage learning independently and providing support;*
- *Encourage learning with other students;*
- *Give work that makes us think;*
- *Provide support;*
- *Teach skills to learn better;* and
- *Provide learning activities that help them to understand the work* (Sh.stu.int. 16 September 2010).

In summary, the role of the teachers was largely transmitters of content knowledge in the lessons. Some played the roles of facilitators of learning fairly well, given the resource constraints they faced. There were effective, as well as not so effective practices, among the lecturers in the College. Less effective practices may be explained by the emphasis on content knowledge and its perceived importance of its transmission to the students. However, it needs to be reiterated at this point is that although good, in-depth subject knowledge is essential for teaching, as argued by Shulman (1992), content alone does not lead to effective teaching and learning as Pedagogical Content Knowledge builds on other forms of professional knowledge, and is therefore a critical and perhaps even the paramount constituent element in the knowledge-base of teaching (Shulman, 1987) that would perhaps assist in promoting student learning in greater degrees in the College. Thus the focus on content was largely misplaced because content cannot be best taught through the transmission mode. The students' desire to be given experience in other forms of learning was palpable as seen in the *In-Lesson Questionnaires* and the *student interviews*.

Role of the Student

In the eight lessons, there was very little to suggest a direct role of the student

in the Planning phase. The only lesson in which the role of students was considered in the Planning process, was *The Way of the World*. Ryan (2008, p. 6) argues that coming to class prepared with some background knowledge, transforms students from passive to active learners. In the other seven lessons, the role of the student was not mentioned in Planning perhaps implying a passive role in that they learnt what was planned for them. However, in the *Students Interview,* students indicated that they would like to be part of the planning by:

- Being *given opportunities to choose their own topics for assignment;*
- *Being allowed more time to do individual work;*
- *Learning through group interactions;* and
- *Working independently with support and guidance from the lecturers* (Sh.stu.int, 16 September 2010).

In the Implementation phase, the roles of students seemed to be as either as active or passive listeners who made notes or copied the information from the slides (as in the *Government Budgeting with reference to India* lesson), responded to questions asked by the lecturers, sometimes enthusiastically voicing their opinions and sharing ideas (as seen in the *Social interactions in everyday life* lesson and to a lesser degree in rank order of *The Way of the World, Borohydrides, Functions (Programming Fundamentals), Application of Trigonometric Theta and Jainism* lessons). Others regurgitated information as the questions were mostly in the recall or comprehension category. A few asked questions as seen in the '*Social interactions in everyday life*, *The Way of the World, Application of Trigonometric Theta* and *Jainism* lessons, while the Botany students conducted experiments as in the *Pollen Germination* lesson and the Computer Science students wrote procedures for the functions of a simple programme.

There was a mixture of the levels of activity in these roles, at one extreme being passive while at the middle and the other end, more active. The highest level of activity was seen in the *Pollen Germination* and *Social interactions in everyday life* lessons. In lessons where they were passive, students were not provided with opportunities to talk and listen, write, read, and reflect on the content, ideas, and

issues in any meaningful way. Thus the role of students was reduced to listening and copying/writing notes. This may reinforce the conception students seeing learning as something done to them by the teachers rather than as something they do for themselves (G. Brown, 2004, p. 7).

However as noted earlier, with respect to planning, students wanted to be active in the lessons and also work in groups and in ways other than listen to lectures. Evidence in the *In-Lesson Questionnaires* (Appendix 4.4) and the *Students Interview* clearly indicated this desire to learn in much more active ways. Excerpts from the *Students Interview* are reproduced to strengthen and confirm this finding:

- *I would say allow for more independent learning, have more learning activities in the class*;
- *There are many ways I learn best like by analysing information given to us or read, writing short stories/poems etc. listening to our teacher explaining things, and reading alone as you understand better*;
- *I am satisfied with the EVS classes as we are sent on surveys, which is more job-related and therefore we learn more. After carrying out the survey we are made to analyse and present in the class. The lecturers guide and help us in solving problems. Whereas in Economics I am partially satisfied as it all bookish knowledge and I can see we could do so many ...* [which] *would have made Economics more practical and hands on;* and
- *I like class presentations and applying theories to case studies because we want to know whether whatever we are studying is practical.* (Sh.stu.int, 16 September 2010).

These comments were illustrative of the students' yearning to learn through much more active and deep approaches in the College classrooms. Some students even suggested ways in which learning could be made much more meaningful and 'hands-on' for them.

This raises a significant point. Perhaps the students were ready to take on a much more learner-centred approach to learning while the lecturers were not altogether prepared to utilise active and deep learning. This, however, is not true of all the students. Indeed the students who populated the eight classes observed for this study fell into three broad categories. The first category included the more

progressive students who insisted on active learning approaches and were active themselves in the lessons. The second category included the students who were reticent and shy in the class but who listened attentively and wrote notes but did not want to participate in the lessons. Then there was a third category of students who were passive and uninterested and did not make much effort to get involved in the lessons. There is no doubt that many factors influenced which of the categories the students fitted into, but it is clear that the most fundamental is rooted in Bhutanese culture and tradition and the learning tradition that has pervaded education in Bhutanese schools (discussed in Appendix 1.1 and Chapter Two). While some changes have already occurred in some students' attitudes, much more time will be needed for all, or even the majority, to take a fully active role in their own learning. By the time current school students are enrolled in tertiary colleges, some students will be likely to appreciate learner- centredness and therefore be more demanding of active roles in their own education. Moreover, the shortage of resources as well as their age has forced students to depend on the lecturers for content knowledge.

In summary, the roles of students varied across the eight lessons, depending upon what and how the lecturers intended to engage them. Although students were mostly passive, there were lessons in which they were active and engaged in comparatively deeper learning.

Summary

Evaluation of the data in the preceding section has addressed the research question – *To what extent do the planning and implementation practices of the lecturers support student learning?* The teaching and learning approaches adopted by the lecturers had significant and diverse consequences for student learning. The evaluative analysis reveals a combination of transmission/teacher-centred and facilitation/learner-centred approaches. While the latter supported student learning, the former clearly did not. At one end of the spectrum, student learning was reasonably successful because the teaching and learning approaches were reasonably learner-centred even in some lectures. At the other end, teaching and learning was based predominantly on 'conventional lectures' and was therefore teacher-centred. In

the former, students were open and interactive and benefitted from the process whereas in the latter, students were relatively passive. Therefore in lessons and for some students, surface learning occurred, while in others, some form of deep learning was evidently taking place. Despite some students' critical comments about the lecturers' teaching, they were largely appreciative and satisfied with the learning they acquired in the College. The use of informal formative assessments during the lessons was not used to its maximum benefit, and therefore did not provide strong support for student learning.

By and large the students' full potential as learners was not maximised. The fact that the majority of the lecturers taught by lecturing, suggested that they either believed, or were forced by circumstances, to act as though they believed that knowledge can be adequately transmitted through their talk, and that 'lecturing' is an effective way to teach. In contrast, students were eager to learn through a range different approach.

Thus the picture of the Planning, Implementation and Evaluation practices of Sherubtse College that emerged from this study is mixed. Perhaps the College wanted to cut its own path as suggested by one of the academics:

> - *We need to improvise, find the middle path because the students' backgrounds are different culturally; come from different types of families and the teaching learning resources available in the classrooms are not adequate. So we need to improvise and develop our own ways to teach* (Sh.aca.int, 15 September 2010).

That the College should seek a 'middle path' by developing its own unique ways to teach, based on the numerous factors in play, is implied in this quote. Moreover, the College has only recently phased out the University of Delhi programmes (2006), which were largely content-oriented. Transition towards the *Wheel*'s policy which highlighted that learner-centred learning be instituted in the Colleges of RUB is likely to take time because curriculum change is difficult, and resistance is often encountered (Skilbeck, 1984). In addition, the situation is complex and no single approach could necessarily generate the significant improvements to

the teaching and learning approaches Therefore it would take some time for these changes to become established in the teaching and learning system in the College, that is, for the lecturers to find that 'middle path'.

Conclusion

In this Chapter, Planning, Implementation, and Evaluation practices in Sherubtse College have been explored in some detail, and the Evaluation section has drawn attention to the key findings regarding the type of practices taking place. Data from the *lesson observation records, students' in-lesson questionnaires, staff and student Interviews* and *the field notes* indicate that it is not only transmission of knowledge that has taken place, but also other moderately active learning that is occurring in the classrooms of Sherubtse College. In the forthcoming Chapter the next case study on the College of Natural Resources is examined.

Chapter Five: College of Natural Resources

Introduction

Overlooking the Lobesa valley at an altitude of 1,300 metres, the College of Natural Resources (CNR) is located in Lobesa, Punakha Dzongkhag in Bhutan. It is a two-hour drive from the capital, Thimphu. The College was established in 1992 as the Natural Resources Training College, the premier training centre for the Renewable Natural Resources Sector of the Ministry of Agriculture. The Swiss Development Cooperation and Helvetas, a Swiss Association for International Corporation provided technical and financial assistance. The main reason for establishment of the College was to promote economic development at the same time as nature conservation through training and professional courses in natural resources management (College of Natural Resources, 2012).

The College was initially set up to revitalise and support traditional farming systems in Bhutan that relied on the inter-linkages and a symbiotic relationship between agriculture, livestock and forests. It pioneered the concept of integrated farming in rural development in Bhutan. This was incorporated into its courses. Being then, and still, a largely agricultural country, farmers in Bhutan live and work under diverse social, economic, political and agro-ecological conditions imposed by limitations of the difficult natural terrain, climates that vary according to altitude and scarce water and land resources. The traditional farming system not only sustained past generations but also conserved the resource base for future generations. Recognising the advantages of these practices, the College, under the aegis of the Ministry of Agriculture, initiated courses to combine the best of both traditional and modern practices while promoting integrated farming in order to boost agricultural economy in rural Bhutan (College of Natural Resources, 2012). The College thus retained, and to some extent still retains, a very close affiliation to the Ministry of Agriculture. When the College began functioning, lecturers were recruited from the Ministry. In 2004, it became a member college of the Royal University of Bhutan and in 2006 was renamed the College of Natural Resources. In the same year the Diploma programmes offered by the College were validated by RUB. In 2010 the full-time B.Sc Agriculture, B.Sc Forestry, and B.Sc

Animal Science were introduced so that in-service extension Diplomates could upgrade and update their knowledge and skills. The College plans to introduce an undergraduate programme in sustainable development by July 2012 and a Masters in Development Practice (MDP) programme by 2013 (College of Natural Resources, 2012).

At the outset, the goal of the College was to produce competent extension agents and fulfil the human resource requirements of the Renewable Natural Resources (RNR) sectors of the Ministry of Agriculture. Over the years, this needs-based goal has broadened to encompass a wider vision. The College now aspires to:

> *Be dynamic, internationally recognised and reputed centre of learning that will contribute to sustainable development of the nation and the region through leadership in education, research and professional services in Agriculture, Natural Resource Management including environmental science and rural development* (College of Natural Resources, 2012).

The College currently offers three, two-year Diploma programmes in Animal Husbandry, Agriculture, and Forestry. The Diploma programmes are largely skills-based, and hands-on training constitutes a major part of the programmes. Students enrolled in the Diploma programmes are provided with training facilities in areas such as animal husbandry, agriculture and forestry laboratories, dairy, poultry, pig, and agriculture farms, and a forest nursery. The College conducts numerous in-service training courses, special and refresher courses for Renewable Natural Resources personnel and farm business training for educated farmers and school-leavers. It also carries out research of national importance and provides professional service related to natural resources management in the country.

The College has an annual enrolment of an average of 70 students in the Diploma programmes. The total student population in 2010 was 247 students across the three diploma programmes. Students enrolled in the College's programmes have passed the higher secondary Class XII, and have a background in science with biology as the preferred subject.

A total of 30 Bhutanese academics teach the Diploma and Degree programmes.

The College has an impressive qualification profile considering its size (Figure 5.1). Although the figure shows only two PhD holders, seven faculty members are currently enrolled in international universities such as University of Reading, UK, University of Bonn, Germany, Chiang Mai University, Thailand and this will lead to a relatively large proportion of staff with a PhD. More than half of the lecturers currently possess Masters degrees, while three who joined recently have Bachelors degree in related fields and three others hold Postgraduate Diplomas. The latter are instructors for the practical components of the course and bring immense and valuable experience to the programmes

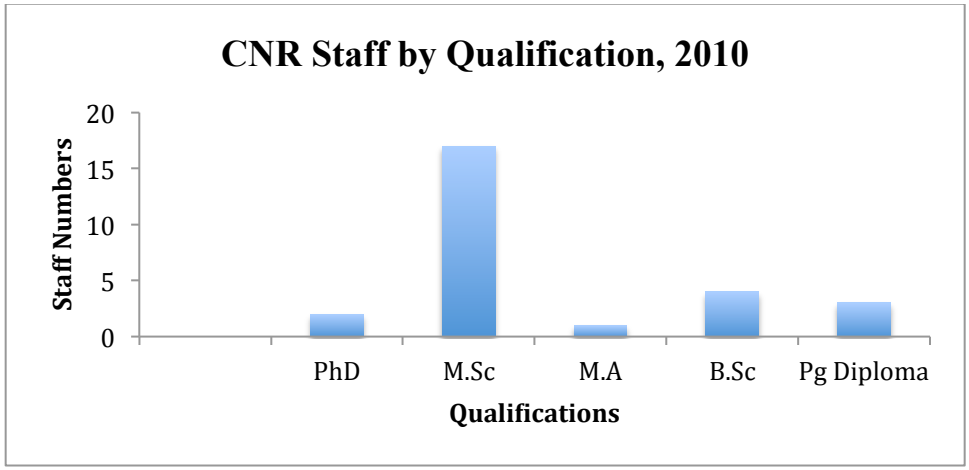

Figure 5.1. – College of Natural Resources Staff by Qualifications, 2010 (RUB, 2011)

Figure 5.2 shows the subject expertise across the four departments in the College. The number of lecturers in the different departments is fairly equal although the Agriculture department has the smallest number of lecturers five whereas the Animal Husbandry has seven lecturers.

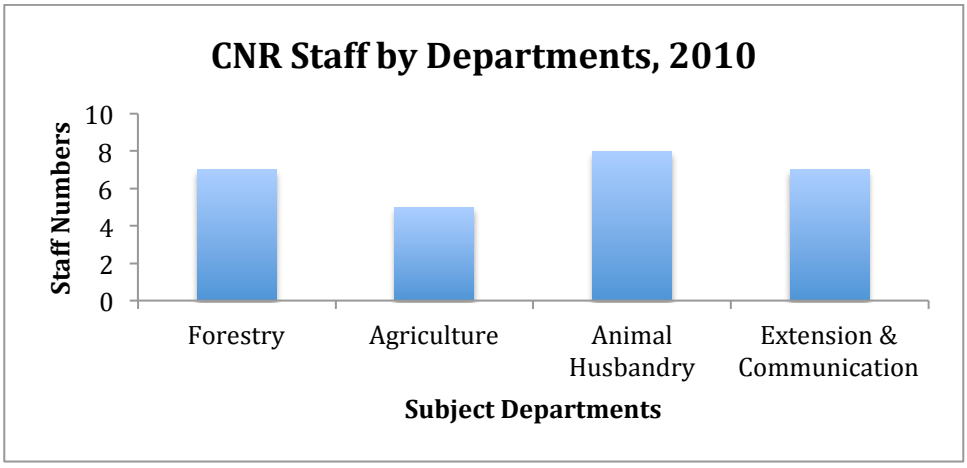

Figure 5.2. – College of Natural Resources Staff by Departments, 2010 (RUB, 2011)

The College is one of the smallest in the RUB, and has a rich resource base as well as highly qualified staff. CNR has an active research culture and conducts research regularly in relevant areas. The students are encouraged to carry out small pieces of research in their final year of study. The atmosphere in the College is warm and welcoming and the environment is professionally vibrant. A walk around the College makes it is apparent that both lecturers and students are engaged in and occupied with their work. This study, like the previous one, examines the nature of teaching and learning practices in the college, using the analytical framework set out in Chapter Two.

Planning

Module plans were readily made available to the researcher. Lesson plans were not commonly in use although two written lesson plans out of the four lessons taught, were available. The two plans were provided by the lecturers teaching *Veterinary Surgery* and *Fundamentals of Plant Protection*. During informal discussions, staff members reported that lesson plans, based on a format prescribed by the College were previously in common use (Appendix 5.1). However, since 2009 this practice was discontinued as the College had launched a Content Management System (CMS). This CMS was designed by Wageningen International, an affiliate of Wageningen University in the Netherlands, under the AsiaLink project in 2008 (College of Natural Resources, 2010). It was implemented with the aim of facilitating fast and easy teaching-learning

processes in the College. The College IT assistant officer explained:

> ➢ *A CMS is a web-based program to which the teachers have full access and authority to create and edit the page/content of their teaching materials/modules based on their own requirements. They can create or edit the contents by themselves. They've been trained how to handle such activities. All the students have free access to CMS. They can not only view, but also download and/or pass comments regarding the contents. All the students have been oriented with the use of CMS* (Cnr.ict.int, 17 August 2010).

With the introduction of the CMS, lesson plans had not been routinely made and lecturers were encouraged to use the CMS for all their teaching needs. The CMS of the programmes contained comprehensive information including lecture notes, handouts, web links and related sources accessible to both students and lecturers. For instance, the webpage for the *Plant Protection* module included a teaching plan, which was a sequence of topics to be taught during the semester, lecturers' notes, student handouts, assessment tasks, and recommended links for additional resources.

Additional information about the use of CMS came from an academic staff member who asserted that the use of the CMS had not replaced lesson plans:

> ➢ *The CMS has not replaced lesson plans fully. It may take another year or so. All teachers are being encouraged to use only CMS, but as with all new technologies, it takes time to adapt and adopt anything that is new. But certainly both the teachers and students are getting used to CMS. It is a very useful tool and effective tool if we know how to use it* (S. Trashi, personal communication, 7 Dec 2011).

Therefore, as part of the analysis it would be worthwhile to find out whether the CMS was being used as a tool to assist lecturers to plan active learning strategies, or if it was only being used as a tool for content development which supported traditional learning styles and strategies.

Similar to the previous case study, as the lecturers who did not have written lesson plans briefly communicated their lessons during the pre-conference interviews, no distinction is being made in this discussion between formal written and informal oral

plans. This section addresses the research question: *What is the nature of lecturers planning that lecturers engage in as they prepare for their lessons?* The module plans, will be referred to in the analysis as they guided the planning practices of the lecturers.

Learning Outcomes

All plans (both oral and written) provided by lecturers in this College included Learning Outcomes (LOs). These LOs are explored and measured against the SMART criteria as explained in Chapter Two (see explanation on the use of the SMART criteria in Chapter Two p. 46).

Specificity

The LOs in the lesson plans are examined for specificity on types of LOs 'subject-specific' and 'personal-generic', as well as 'levels of thinking' from Bloom's taxonomy (1956, revised by Anderson & Krathwohl, 2001).

All of the LOs described by the lecturers showed a strong subject-specific orientation, based on knowledge and skills required by the students enrolled in the diploma programmes in the College. None fell into the personal-generic category. Table 5.1 illustrates the types and levels of thinking in the LOs including those related to the specific SMART criteria.

Table 5.1 Types and Levels of Thinking in the Learning Outcomes across the four lessons

Lesson	**Examples of Learning outcomes**	**Type**	**Level of Thinking in the revised Bloom's taxonomy**
Wound Treatment - Treatment of wounds in animals (Cnr.vts.lp, 18 August 2010)	Define different wounds	Subject-specific (knowledge-based)	Remembering
	Give examples of open and closed wounds	Subject-specific (knowledge-based)	Understanding
	List steps for general line of wound treatment	Subject-specific (skill-based)	Remembering

Lesson	Examples of Learning outcomes	Type	Level of Thinking in the revised Bloom's taxonomy
	Name at least one ointment for use in treatment	Subject specific (knowledge-based)	Remembering
	List different methods of haemorrhage control	Subject-specific (knowledge-based)	Remembering
Insect Collection – purpose of collecting and preserving insects (Cnr.plp.lp,16 August 2010)	Explain 5 possible reasons why insects are being collected and preserved	Subject-specific (knowledge-based)	Understanding
	Explain the relevance of this knowledge and skill in the field of extension	Subject-specific (skill-based)	Applying
	List the required materials in collecting and preserving insects	Subject-specific (knowledge-based)	Remembering
	Explain the different methods employed for collecting insects	Subject-specific (skill-based)	Understanding
Soil Water (Cnr,ssc.lo, 19 August 2010)	Understand soil-plant nutrient relationship	Subject-specific (knowledge-based)	Remembering
	Explain the soil plant nutrient relationship	Subject-specific (knowledge-based)	Understanding
Chainsaw Tasks and Techniques (Cnr.forst.lo, 19 August 2010)	Know the importance of a thorough up [sic] before limbing, mushing, slashing and bucking	Subject-specific (knowledge-based)	Remembering
	Get the skills needed to operate a chain saw safely and efficiently	Subject-specific (skill-based)	Creating
	Identify the types of binds	Subject-specific (skill-based)	Understanding

All the LOs included theoretical input designed to prepare students for the practical sessions. Examples include preparation of an insect box in the *Insect Collection-pinning and setting* lesson, treating wounds in animals in the *Wound*

Treatment lesson, using the chainsaw safely and effectively in the *Chainsaw Tasks and Techniques* lesson and establishing the soil-water relationship in the *Soil water* lesson. The LOs were further categorised into knowledge-based and skills-based as the Diploma programmes offered in the college are professional qualifications that require students to be competent in both. The combination of knowledge- and skills-based LOs was therefore pertinent for students' learning in their respective subjects. However the use of the words '*know*' and '*understand*' in these LOs was ambiguous as these verbs did not contain explicit indications of what had to be done or demonstrated by students to show they had understood or learnt to articulate the level of attainment. Further the use of '*get*' in the *Chainsaw Tasks and Techniques* (Cnr.forst.lo, 19 August 2010) LO was similarly unclear as it could be open to multiple interpretations.

The LOs were mainly focussed on lower levels of thinking (Table 8.3 in Appendix 8.1) with approximately 86% (N=12) at that level and the remaining 14% (N=2) belonging to the higher levels of thinking. The lower levels of thinking were mainly clustered around '*remembering*' and '*understanding*' while the higher levels of thinking were 'creating' and 'applying'. Although most of the LOs were at the lower cognitive levels, they were subject-specific and appropriate to the level of the professional diploma courses. As previously noted they were prerequisites for the practical sessions that followed the theoretical input of the respective lessons. The students required a good grasp of the materials and procedures before they actually practiced them. Additionally, using Bloom's Taxonomy too rigorously can limit the LOs as sometimes lower levels of thinking are required before the students move onto the higher levels of thinking (Hussey & Smith, 2002). Therefore, although the LOs were mostly at the '*remembering*' and '*understanding*' levels, they were relevant and appropriate to the level and the intent of the lessons. However, it is possible that some of the more advance students might not have been adequately challenged intellectually in the lessons.

A comparison of the LOs included in the lessons with those planned by the lecturers beforehand found that the written LOs were more focussed, well thought out and specific, and therefore better developed than those that were not written.

Measurability

Most of the LOs in the four lessons were readily measurable. For example, in the *Wound Treatment* lesson, the LOs were measurable since outcomes of the lesson included activities such as students being able to recognise, clean and treat wounds in animals. The LOs demonstrated what the students would be able to do such as *Define different wounds, List steps … , Name at least one ointment …* and *List different methods …* (Table 5. 1). Similarly in the *Insect Collection* lesson the LOs (Table 5.1) were measurable as specific learning behaviour was targeted: *Explain five possible reasons … , Explain the relevance … , List the materials required …* to *pin and set the insects after collecting them* (Cnr.plp.lp, 16 August 2010). However in the *Chainsaw Tasks and Techniques* lesson, only one LO was measurable: *Identify the types of binds (*Cnr.forst.lo, 19 August 2010). The other LOs, which stated *Get the skills …* and *Know the importance …* did not specify specific learning behaviours. The LO in the *Soil Water* lesson, *Understand the soil-plant …* was clearly not measurable but *Explain the soil …* (Cnr.ssc.lo, 19 August 2010) was measurable. Consequently the development of measurable LOs was not consistent in the four lessons.

Achievability

As seen in Table 5.1 the LOs in the four lesson plans were written clearly and within the range of the students' capacity. The LOs stated what they wanted students to do. For example the LOs in the *Insect Collection* lesson plan, required students to *Explain…,* and *List…* while in the *Wound Treatment* lesson plan the LOs required students to *Define…, Give examples…, List…*, and *Name….* In the *Soil Water* lesson, however, the LOs contained the words *Understand* and *Explain*. The word *understand* is difficult to assess for achievability as it is too broad and open to multiple interpretations. Similarly the *Chainsaw Tasks and Techniques* LOs used *know* and *get* both of which incurred with the same problem as *understand*. Only one LO in the latter lesson was clearly stated; it used the word *Identify* which students would be able to demonstrate (Table 5.1).

Relevance

As listed in Table 5.1 the LOs in the four lessons were relevant and consistent

with the requirements of the three Diploma programmes. They addressed the mandatory workplace requirements of the Agriculture, Forestry, and Animal Husbandry departments. The knowledge and skills in the LOs were therefore appropriate and related to the students' learning; upon achieving the LOs they would be able to perform the tasks specified in the lessons. For instance the LOs in the *Wound Treatment* lesson planned for students to be able to *Give example for closed and open wound, List steps of general line of wound treatment, Name at least one ointment for use in treatment* (Cnr.vts.lp, 18 August 2010). Acquiring an understanding and the skills specified in these LOs were relevant to the context of the lesson, as students specialising in the Animal Husbandry Diploma would require them in their workplace. Similar trends could be observed in the LOs of the other three lessons indicating the relevance and applicability to the students' training context.

Time-Scaled

The LOs for the lessons were generally planned appropriately for the available time frame. The LOs for the *Wound Treatment* lesson allowed for an hour and a ninety-minute period, while one-hour periods were planned for the other three lessons. The LOs were subject-specific i.e. they provided students with the information needed to treat wounds in animals, to collect insects, to operate the chainsaw safely and to identify the soil-water relationship comfortably within the time-period set for the lessons.

Again LOs in the written lesson plans were far better developed and feasible than the ones that were only orally communicated in the pre-conference interviews - a finding that reinforces the importance of writing lesson plans. Where lesson plans had been written there was evidence of planning, for specificity, measurability, achievability and relevance.

Teaching and Learning Approaches

The teaching and learning approaches planned by the lecturers involved in this study are now examined in order to identify how the four lecturers at the College planned to influence, motivate and inspire students to learn.

Organises active engagement with learning tasks

The teaching and learning approaches described in the two written lesson plans were presented as *acting patterns* (refer to Appendix 5.1 for sample copy of lesson plan). In the *Insect Collection – pinning and setting* lesson plan, acting patterns were written as *Explain… , Exhibit…* followed by *Lectures* in the main body of the lesson. Whereas in the *Wound Treatment* lesson plan, the main acting pattern was written as *Standing*, which perhaps meant standing and lecturing as there were comments under the 'Means' column in the lesson format which identified *verbal*, *movie clips* and *blackboard* (Appendix 5.1). In essence, all of the LOs identified 'lecture' as the main approach that was planned for use, supplemented by teaching aids such as a model of the insect box in the *Insect Collection* lesson, and chalkboard explanations and movie clips in the *Wound Treatment* lesson. Further in the *Soil Water* and *Chainsaw Tasks and Techniques* lessons (for which no written plans were available), the lecturers communicated during the pre-conference interviews that they would use PowerPoint presentations to present information to the students (Cnr.fld.nt, 15-20 August 2010). This too suggested a conventional and passive lecture style in which active student engagement with learning tasks would not occur. However in the module plans (Appendix 5.2) the lecturers had identified a combination of teaching and learning approaches such as lectures, group work and practical work. The module plans also indicated an efficient distribution of time between classroom teaching and practical training (Appendix 5.2), providing evidence that although '*lecture'* was the planned common approach, there were also other strategies such as group work, individual work, demonstrations and practical field exercises that would be used to actively engage the students. This reflected the thoroughness of the lecturers as they had even mentioned the time students should spend on self-study (for example: 17 hours in the *Soil Science* module) and writing their assignments (for example: 24 hours in the *Soil Science* module). Although the module plans included details of several teaching approaches that would actively engage the students; the lesson plans were sparser in their information about active engagement of students with the learning tasks. This comparison with the module plans suggested that the module plans were not closely

consulted during lesson planning.

Provides opportunities for interaction amongst students and with the lecturer

Opportunities for interaction were absent from the lesson plans - written or oral - though they were evident in the module plans for group and individual classwork as well as in the field practical sessions. See Appendix 5.3 for more details on module plans. This suggests that while module plans had suggestions for interaction, the lesson plans did not carry them over, further evidence that the development of lesson plans was not guided by the module plans. Or perhaps it could also be that the theoretical input was seen as something different as a way of learning from other contexts example the practical sessions. The difference between evidence of this indicator in lesson and module plans, is even more significant in the Implementation phase of the teaching and learning cycle.

Initiates vigorous and critical interaction with knowledge content (invokes deep learning)

The lesson plans, in general, did not include this indicator. One possible exception was in the *Insect Collection* lesson plan in which the inclusion of *explain* suggests interaction with the content as the explanation could be followed by a Question and Answers (Q&As) session. Similarly the module plans did not specify interaction with content although the inclusion of group and individual work, demonstrations and practical work in the four modules which provided opportunities for interaction.

While lesson plans contained references to '*lecture'* as the main teaching approach, the module plans had, in addition to the 'lecture' a modest combination of other relevant teaching and learning approaches designed to promote interaction in the classes.

Content Knowledge

In this section the depth, breadth and relevance of content planned for the four lessons is examined. While they were explicitly stated in the written lesson plans, the content was implied in those that were orally communicated during the pre- conference

interviews. For example, in the written lesson plan for *Wound Treatment*, the content component in the main body of the lesson listed as many 15 subtopics to be covered in the ninety-minute lesson:

> *Define wound; Causes of wounds; classify wounds; treatment of wounds; treatment of closed wound – abscess, haematoma, maggot wound, tiger bite wound and avulsion; History of anaesthesia, definition of, principle of, classification of, Route of administration, Precaution of over dosage; Preparation of surgeon- washing and precautions* (Cnr.vts.lp, 18 August 2010).

Although reference to fifteen 15 subtopics illustrated the breadth of this topic the lesson plan, because there were so many subtopics to be covered in the lesson schedule, the depth that would be involved in the teaching of each subtopic was not specified. On the other hand, both depth and breadth were shown in the written lesson plan for *Insect Collection* as the subtopics listed in some detail - breaking up each subtopic into further subtopics for treatment in greater depth:

> *Five possible reasons for collecting insects – identification of insect, recording of the insect, decoration (butterflies)*; *Relevance of this knowledge and skill in the field of extension – Diagnostic purpose; Required materials – insect bottle, plastic bag, sweeping new, cotton wool and chemical, insect pins and setting board; Explain different methods employed for collecting insects; Methods of killing insects; Setting and drying insects* (Cnr.plp.lp, 16 August 2010).

In the oral lesson plans, there was only limited reference to the depth and breadth of the content to be covered. The lecturers simply mentioned the topics that would be taught in the lessons. For example, in the *Chainsaw Tasks and Techniques* lesson, the lecturer mentioned that the lesson would be on how to use the chainsaw effectively and safely (*(*Cnr.forst.lo, 19 August 2010), while the other lecturer in the *Soil Water* lesson said that the lesson would focus on the soil water relation.

With regard to relevance, the content of the four lessons were related to the students' workplace and was clearly useful for them. Relevance of the content indicated that the lessons fitted appropriately into the modules, which were within the context of the programmes leading to the Diploma in Animal Husbandry, Forestry, and

Agriculture awards.

Assessment

The form of assessment that was explicit in the plans was assessment of prior learning. For example, in the *Insect Collection – Pinning and Setting* lesson plan, the lecturer wrote '*Review of last lesson*' in the opening phase of the lesson plan (Cnr.plp.lp, 16 August 2010). This could be interpreted as a way of assessing prior learning at the beginning of the lesson, by posing a series of questions to the class. The closing phase of the lesson plan also had *Summary* that was, in effect, informal formative assessment. In this same phase a reference to *Test* implied summative formative assessment since the test would be conducted at the end of the lesson to find out how much students have understood of the lesson. In the *Wound Treatment* lesson, in the opening phase it was stated *Ask questions on previous lesson* (Cnr.vts.lp, 18 August 2010) to find out whether students had understood the previous topic and was not assessment of prior learning but more of recalling the previous lesson content.

On the other hand there were no details about assessment in the *Soil Water* and *Chainsaw Tasks and Techniques* lessons other than reference to asking questions, which suggested that the lecturers planned to use some form of informal formative assessment. More detailed information on informal formative assessment is included in the Implementation Phase of the lessons.

The module plans, however, provided detailed assessment strategies such as semester-end examinations, and on-going assessment with assignments, practical reports, and small written exams throughout the semester. These references suggested significant use of summative assessment.

Resources

Resources that were planned for use in the lessons are examined for effective use and variety to enhance learning. The two written lesson plans listed various resources; for example the *Wound Treatment* lesson had *forceps, syringe and needle, cotton, scissors, drugs* listed as resources under *Materials, Tools, Equipment (for practical in field, laboratory, workshop)* and *Blackboard, OHP and movie clips* listed as

Teaching Aids (Cnr.vts.lp, 18 August 2010). These were subject-specific and general resources for treating wounds in animals. In the *Insect Collection* lesson plan, the resources listed under *Teaching Aids* were *AVA, Information sheet, assignment, test,* (Cnr.plp.lp, 16 August 2010). For the lessons that did not have written plans, the lecturer teaching the *Chainsaw Tasks and Techniques* lesson mentioned that he would bring a chainsaw to show the different components to the class and the *Soil Water* lecturer said she would use a PowerPoint presentation with diagrams of the soil-water relationship and other relevant information. The use of resources is important for technical lessons such as these, as the students need to become familiar with the material, equipment or tools to be able to treat wounds, pin and set insects, identify parts of a chainsaw and the identify soil-water relationships correctly.

Role of teacher

The plans, whether written or as mental constructs, showed lecturers in the role of main decision makers. They had the responsibility for developing the LOs, teaching and learning approaches, content topics, assessment strategies and organisation of the resources designed to ensure successful student learning.

Role of the Student

There was little to suggest that students played any role in the planning phase in any of the four lessons or in the module plans. It was observed that the role of students in planning was considered to be passive - simply learning what the lecturers planned.

Use of Content Management system as a lesson-planning tool

As flagged earlier in the planning phase whether the CMS was used as a tool to assist lecturers to plan active learning strategies or it was only being used as a tool for content development, a search of the College CMS website for information on planning revealed that there were marked differences in the amount of detail about module content available in the CMS. While the modules on *Insect Collection* and *Wound treatment* had detailed information including lesson handouts, lecturer's PowerPoint presentations, quizzes, and tests, the other two lessons (*Soil Water* and *Chainsaw Tasks and Techniques*) did not contain similar levels of information in their corresponding

CMS links. These were also the same lessons for which no written lesson plans existed, which suggests that the lecturers who did not develop material on the relevant CMS sites were also those who did not write lesson plans.

Summary

This analysis has addressed the research question: *What is the nature of lecturers planning that lecturers engage in as they prepare for their lessons?* and identified a number of findings.

Significant among these is that, there were two different forms of planning practised by the lecturers. Plans were provided in two different forms: written and as mental constructs that were only described orally. Existence of these two forms made it clear that planning practices in the College were not consistent. Although the previous practice had been to develop lesson plans using a format prescribed by the college (Appendix 5.1), since 2009 with the introduction of the CMS, lecturers had been encouraged to use plans in that system instead. Some lecturers used the CMS for their planning needs while some still used written plans. Absence of proper written lesson plans is one explanation of why the 'mental constructs' were rather sparse and contained little information.

Findings regarding use of the SMART criteria for LO development were mixed. There was evidence that some LOs had been developed to reflect the requirements of the SMART criteria. However others contained less appropriate action verbs to indicate what they wanted students to do in the lessons. Not much attention was accorded to assessment generally, with informal formative assessment evident only in the two written plans.

Planning for teaching and learning approaches in the lessons predominantly pointed towards the use of conventional *lectures*. In the written lesson plans, lecturers indicated that they would use resources that were quite varied and appropriate to the subject context in order to support and enhance teaching and learning. In oral lesson plans, however, reference was only made to the use of PowerPoint and chainsaw demonstrations. The lecturers' roles were clearly central in the planning, and they made

decisions regarding what was to be a taught and how it would be taught. In contrast, students had an insignificant role in the planning phase. It is, therefore, concluded that the planning practices were to a great extent teacher-centred.

Implementation

In this section, the same seven categories and related indictors applied to the Planning practices of the lecturers are used to guide the exploration of the implementation of the lesson plans.

Learning Outcomes

The discussion addresses what learning outcomes were evident during implementation phase.

It was observed that the LOs planned by the lecturers for the four lessons were all implemented. For example in the *Insect Collection* lesson, the four LOs listed in Table 5.1 were '*Explain 5 possible reasons … , Explain the relevance of this knowledge … , List the required materials … ,* and *Explain the different methods …*' (Cnr.plp.lp.16 August 2010). The lecturer had organised his PowerPoint presentation around these LOs, and by asking questions of students ensured that they were able to 'explain and list' as he had planned. Similar patterns were observed in the other three lessons in which lecturers ensured that the LOs were achieved, by explaining and asking questions.

Determining whether LOs had actually been achieved for the students, however, would have been difficult for lecturers in some contexts, particularly as the four lessons were conducted using the *'lecture'* method. Because not all the students actively participated in the subsequent Q&A sessions, it was not possible to assess whether *all* the students had achieved the LOs set for these lessons.

Besides the implementation of planned LOs, several LOs that were unplanned were observed being implemented in the four lessons. The unplanned LOs have been referred to as the 'hidden curriculum by Jackson (1968) and evidences of such practices were noted in the four lessons. For example in the *Insect Collection* lesson, it was

observed that the lecturer emphasised:

- *The importance of recognising the insects during collection as it would help in identifying the diseases in common plants associated with insects. Pinning the insects correctly while making the insect box so as not to damage them and therefore not have to collect insects again* (Cnr.ppl.lo, 16 August 2010).

In the *Soil Water* lesson the unplanned LO that was implemented besides the planned LOs was related to more academic issues. The lecturer spent some time explaining the variation of terminologies in Soil Water relationships that are used in different references books, cautioned the class about using information from the Internet as some could be confusing, and recommended that students should use information from the authentic sites only (Cnr.ssc.lo, 19 August 2010).

In the *Wound Treatment* lesson, unplanned personal-generic LOs included the lecturer's caution not to use force while treating the horn wound as it might cause more damage (Cnr.vts.lo, 18 August 2010). The other such LO was based on prompting the students to use their common sense while working in the field and to use the local environment to advantage. Ice packs, for example, were not required for cold antiseptic treatment in the cold mountain places in Bhutan as the water was very cold (Cnr.vts.lo, 198 August 2010). In the *Chainsaw Technique* lesson, which was about safety using chainsaws, the unplanned LO occurred when the lecturer made reference to the students' future workplaces in which they would be required to be extra cautious and remain alert to avoid fatal accidents (Cnr.forst.lo, 19 August 2010). In addition, the lecturer reassured the student about the safety arrangement during the field practice, experts in the field would be present to help them use the chainsaws safely (Cnr.forst.lo, 19 August 2010).

In summary, there were both planned and unplanned LOs in operation in the lessons during the implementation phase.

Teaching and Learning approaches

In this section, approaches to teaching and learning that were recorded from *Lesson Observation records, In-Lesson Questionnaires* completed by the students and

the *Field Notes*.

Organises active/passive engagement with learning tasks

The four lessons that were observed had the following characteristics that engaged students with the learning tasks. The most common method of teaching in this College, as in the previous one, was *'lecturing'*. However, the four lecturers used PowerPoint presentations to convey content to the students, and the lectures were not completely dominated by teacher talk. Lecturers asked questions and provided demonstrations during the lectures to engage the students with the lesson. This is best illustrated in the following two lessons.

In the *Wound Treatment* lesson (Cnr.vts.lo, 18 August 2010) the lecturer used questions, video clips about wound characteristics and anaesthetising a dog, and demonstrations of treatment of wounds at appropriate intervals during the lesson. The students listened to the explanation, responded to the questions, observed the demonstrations, and watched the video clips during the lesson. Students were actively engaged, especially as the questions asked during the second half of the lesson on *Operative Surgery* were higher order thinking questions such as:

- *What will happen when the central nervous system and brain of the animal are depressed? Think about it*.

The students were advised to think before they answered the questions, advice which indicated that the questions required higher-level thinking. Other questions which were asked after explanation were given, required recapitulation, clarification and factual responses that required lower cognitive levels only.

On the other hand, when the students were given opportunities to ask questions of their own, they were quiet. Students took notes during the lesson, which indicates some form of active engagement, and it was observed that*; the students listened attentively* and *appeared interested and engaged in the lesson* (Cnr.vts.lo, 18 August 2010). Responses in the *In-Lesson Questionnaire* revealed that 95% of students believed that the lecturer encouraged them to actively participate in the lesson (Cnr.vts.lq. 18 August 2010).

Further, comments such as:

- *Most of the lesson engaged us to participate more, better atmosphere, There is demonstration method along with theory classes…movie clips are shown to clear and understand our doubts on the module* [sic]; and
- *He really interacts with the students* (Cnr.vts.lq, 18 August 2010)

verified that the students were active listeners. This finding corroborated the lesson observation record (Cnr.vts.lo, 18 August 2010) in which it was noted that the students were modestly active in the lesson; they listened, took notes, observed the demonstrations, watched the video clips and responded to the questions.

The *Soil Water* lesson, on the other hand, although a lecture-based with PowerPoint presentation was a little different. The lecturer asked questions of the students instead of explaining the PowerPoint information to engage them more actively in the lesson. Questions such as:

- *Why is it important to know the factors that determine the movement of water in the soil?* and
- *How does water move in the soil?* (Cnr.ssc.lo, 19 August 2010).

The students too were advised to think before they answered the questions suggesting the requirement of higher-level thinking. This technique was a resourceful strategy as the class was large with 90 students and was held in the College auditorium, a space that was not designed for interactive teaching and learning activities. The lecturer also moved around the class between the rows of the students using a microphone to ensure that all could hear her. This made the students, including those at the back of the hall, attentive and involved in the lesson. By moving around the class the lecturer made herself accessible to the students throughout the lesson. It also helped the lecturer to see whether students were 'with' her during the lesson. The lecturer also asked students to copy the diagrams and reminded students to take notes of the important points during the lesson (Cnr.ssc.lo, 19 August 2010). The students were kept engaged through the lesson, responding to questions, listening to the explanations, taking notes and copying the diagrams of adhesive and cohesive forces in the soil

(Cnr.ssc.lo, 19 August 2010). Although a large portion of the lesson, about 35-40 minutes (out of one hour), was spent on lecturing, the remaining time was spent engaging the students in such activities as thinking (before answering questions), copying the diagrams, and taking notes. Even though the latter two activities may not involve a high level engagement they nevertheless engaged the students in various ways.

The accuracy of these observations can be further confirmed by the responses to the students' *In-Lesson Questionnaire* in which 89% of the students rated '*Encouraged me to participate'* as excellent or good, while 7% thought the level of engagement was acceptable and only 4% rated it as unsatisfactory. Those who did not rate the level of engagement as high commented that:

- *We are supposed to write and listen to the lecturer at the same time. It would be better if the lecturer could explain and give time for the students to write;* and
- *The lecturer is giving explanation at the same time we have to write* [sic]. *So it is a problem for us to understand* (Cnr.ssc.lq, 19 August 2010).

Effective note-taking from lectures is an essential skill for university study (G. Jones & Mort, 2009) as it helps students to simultaneously concentrate on the lecture and remember information after the lecture and often record in their own words.

The other two lesson observations, on *Insect Collection* and *Chainsaw Tasks and Techniques,* showed less student engagement. Conventional lectures were used and students were only partially engaged through questioning (Cnr. Plp.lo, 16 August 2010 and Cnr.forst.lo, 19 August 2010).

To summarise, the lecturers incorporated modest levels of active engagement but their classes were primarily dominated by lectures, which largely fostered passive engagement.

However, considering the practical nature of the diploma programmes, the primary purpose of these lectures was to make the students familiar with the content and expose them to the theoretical aspects of the topics so that they can be used practically

in the field. Nevertheless this dichotomy is not helpful as learning activity included in lectures is a more effective strategy. The use of 'lectures' in association with practical sessions was observed to be a part of the learning process for the students as the lecturers frequently made reference to the practical application of the theory (Cnr.fld.nt, 15 – 21 August 2010). The descriptors for each of the four modules made explicit reference to the practical components of the topics (Module plans in Appendix 5.2).

Provides opportunities for interaction amongst students and with the lecturer

As conventional 'lecturing' was the main method of teaching, opportunities for students to interact with each other either through pair/group work or even class discussions were absent. The main interaction occurred between the students and the lecturers. For example in the *Chainsaw Tasks and Techniques* lesson, the lecturer asked students questions to check their understanding at regular intervals. He moved around the class while explaining so that all the students could feel included in the lesson as well as be attentive. (Cnr.forst.lo, 19 August 2010). However, apart from this type of interaction the students were not given opportunity to talk, discuss, or consult among themselves during the lesson. The entire lesson was mainly one-sided focussed on the lecturer – explaining and asking questions of the students. Moreover only a few students were involved in responding to the questions, not the entire class. It was only when the lecturer informed the class about the field practical class which was to occur the next week that the trees had been identified ready to be felled using the chainsaws by the students - there was some excitement and some interaction between the students. They expressed some apprehension, and the lecturer assured them that other experts would be attending the field to help them (Cnr.forst.lo, 19 August 2010). In this class it could safely be said that the interaction was controlled and mainly between the teacher and students.

Similar patterns of interaction were observed in the other three lessons, but the amount and type of interaction varied. For instance, in the *Soil Water* lesson, the lecturer made it a point to involve the students by not completely explaining all the slides; instead she asked questions of the students about the information on the slides. When the students responded, they engaged with the content of the PowerPoint slide,

enhancing comprehension and then shared their understanding with the class (Cnr.ssc.lo, 19 August 2010). Although this type of interaction was not the dominant type in the lesson, it was a powerful way of promoting student learning by providing opportunities to engage with the content and interact with the other students in the class.

Studies of teacher-student interaction (Cowie et al., 2005) emphasise the critical importance for classroom learning of the teachers' manner in class. In this lesson, the teacher's disposition was friendly, and she demonstrated good relationships with the students. She used humour in the lesson when it was appropriate, such as while explaining how and why plants wilt when the soil water balance is disturbed, she paused during this explanation and asked, with humour; *Is anyone wilting in my class?* Such light moments helped to dissipate the intensity of the lecture. In the *In-Lesson Questionnaires* for the lesson, the students commented:

- *She teaches well in which students are encouraged* [Sic];
- *She really makes the class interesting by providing a very well prepared presentations with lots of information on the lesson that she is going to present;* and
- *The atmosphere for learning was great* (Cnr.ssc.lq, 19 August 2010).

These comments indicated that although the class was very large (90 students), learning did take place and students were appreciative of the lecturer's efforts.

Thus opportunities for interaction varied. In some lessons there was one-way communication which went from the teacher to the students, whereas in others there was interaction from the students. The particular style was attributable to the personal characteristics of the teachers, the manner in which they relate to the students, and to their teaching as seen in the *Soil Water* lesson.

Initiates vigorous and critical interaction with content knowledge (invokes deep learning)

Among the four lessons, a greater level of interaction with content was observed only in the *Soil Water* lesson. As described earlier, the lecturer provided opportunities for students to interact with the content when she asked the class questions, motivating

them to think about and engage with the lesson content before providing their responses.

The questions:

- *How is it [water] available to the plants?*
- *Under what conditions will water flow?*
- *Why do plants wilt?*
- *What causes them to wilt?*
- *How does subsurface drainage promote better plant growth on poorly drained soils?*
- *What is meant by the 'sponge effect' of subsurface drainage?*

involved fairly high-level thinking, as the students had to make links to processes of adhesion, cohesion, water potential, types, classification, sources of soil water, and soil water classification. The questions required that students be able to apply previously understood concepts to the soil water context (Cnr.ssc.lo, 19 August 2010), which also promoted reasonably deep levels of learning. The lecturer provided instructions for the follow-up task (which was not observed by the researcher): 'Classify the soil quantitatively by connecting one property of water in the soil with others in order to get a better and deeper understanding'. The lecturer thus provided clues and instructions about ways to undertake the task (Cnr.ssc.lo, 19 August 2010). This indicated that the lecturer wanted students to develop an in-depth understanding of the properties of soil water (Cnr.ssc.lo, 19 August 2010) thus promoting moderately vigorous and critical interaction with the content of the lesson.

In the lesson on *Wound Treatment,* the lecturer also asked students moderately higher-level questions such as:

- *How will you assess the seriousness of the horn wound in the cow?*
- *What precautions have to be kept in mind while administering anaesthesia to animals of different sizes like a dog or cow? Think about it* (Cnr.vts.lo, 18 August 2010).

These questions clearly prompted the students to think about their responses. It was

observed, however, that the questions in this lesson did not have the same effect as they did in the *Soil Water* lesson. In the former lesson, there was a lower level of critical interaction with the content of the lesson. Further, the question time was brief and there was no connection made with prior learning as done in the *Soil Water* lesson. Nor were there opportunities for deep learning or vigorous interaction with the lesson content in either the *Insect Collection* lesson, or the *Chainsaw Tasks and Techniques* lesson. For the most part, the questions used in these two lessons simply required students to recapitulate, clarify, or recall, factual information.

Opportunities for interaction varied. In some lessons the direction of communication was only from the teacher to the students. In the *Chainsaw Techniques* lesson, for example, approximately 85% of the time was spent on teacher explanation and approximately 15% on interaction when the lecturer asked questions and students responded (Cnr.forst.lo, 19 August 2010). In the *Soil Science* lesson interaction between the teachers and among the students occupied approximately 30% of the lesson time during the Q&A session (Cnr.ssc.lo, 19 August 2010). In the other two lessons, the time spent on interaction in the class occupied less than 30%.

In summary, modest levels of active learning were incorporated into the lectures in the four lessons. Lecturers transmitted knowledge in lectures and facilitated learning by asking questions, frequent explanations of the content, and making resources available to the students to enhance and support their learning. In all the lessons observed for this study, reference was made to the practical components, which would follow the theoretical components of the lessons (Cnr.fld.nt, 15 – 21 August 2010). Interaction with content occurred in the *Soil Water* lesson and to a lesser degree in the *Wound Treatment lesson* with questions used to provoke the students to think and answer. In the other lessons questions were not used as effectively.

Content Knowledge

Relevance, depth, and breadth of content in the four lessons are examined. The lessons were from across levels in the Year 1 and Year 2 Diploma programmes. For the purposes of this analysis, the expertise of the lecturers involved in the study was

accepted as given. Analysis is based on what was observed and understood.

Depth and Breadth of content

Depth and breadth of content was observed at varying degrees in the four lessons. The lesson on *Wound Treatment* covered extensive content, which began with identification of wounds such as those in a cow's horn and included detailed explanations of procedures for treating those wounds. Description of a bite wound on a domestic animal, the characteristics, and how to identify the animal (leopard or tiger) that attacked, and treatment of such wounds took up 55 minutes of the lesson of the allotted 90 minutes. A video clip on identifying tiger's bite on cattle was shown followed by inviting students to ask questions. After e few minutes break, the lecturer started on *Operative Surgery* and explained the history and classification of anaesthesia, and how to administer it to animals. A video clip demonstrating how anaesthesia is given to a dog was also shown to students. (Cnr.vts.lo, 18 August 2010). Although the breadth of information was vast, the depth of the topics was also sufficient to provide a sound theoretical understanding of wound treatment. In the *Chainsaw Tasks and Techniques*, *Soil Water* and *Insect Collection* lessons, the depth and breadth of the content were adequate for the level and requirement of the courses.

Links content to other subject areas and everyday life of students

Links to future workplaces were particularly focussed, and integrated into the context of the lessons and the diploma programmes in which the students were enrolled. An example of this connection was demonstrated in the *Wound Treatment* lesson. In explaining the use of cold antiseptics as the first step in treatment of horn wounds, the lecturer reminded the students that ice would not be required in Gasa and Lunana (high Alpine regions in Bhutan) where the water was very cold and could be used instead (Cnr.vts.lo, 18 August 2010). Similarly, references were made to the students' future work situations during the *Insect Collection* lesson when they were taught how to identify and rid crops of harmful insects (Cnr.plp.lo, 16 August 2010). In the *Chainsaw Tasks and Techniques* lesson, the lecturer made reference to fieldwork in which students would be required to use a chainsaw safely to fell trees.

Assessment

Assessment used by the lecturers in the four lessons are examined using the indicators identified in Chapter Two.

Selects, constructs and utilises appropriate assessment strategies (formative and summative)

The most common type of classroom assessments observed in the lessons was informal formative assessment, characterised by informal conversations such as asking questions to review the students' understanding of what was taught, and checking for understanding at different phases of the lesson to guide the lecturers in their teaching. In the *Insect Collection, Wound Treatment and Chainsaw Tasks and Techniques* lessons, for example, the lecturers asked the class several times throughout the lesson "*Have you all understood what has been explained so far? Any doubts?" "Any questions on what has been explained?"* This was done to establish evidence of students' understanding of what was being taught.

On the other hand, in the *Soil Water* lesson specific questions such as:

- *Why is it important to know about the factors that determine the movement of water in the soil?*
- *How does the water in different types of soil get to the plants?* (Cnr.ssc.lo, 19 August 2010)

were asked by the lecturer.

Asking questions of students was a strategy used by lecturers to support informal formative assessment of learning. Questions asked to check students' understanding during the lessons elicited a variety of responses. Specific questions elicited fairly detailed responses from students, while students responded with *yes* or *by nodding affirmatively* to indicate their understanding when general questions were asked. The differences in the purpose of the questions also made a difference in the learning that took place. When the lecturers utilised the responses and built the lesson on them (as seen in the *Soil Water and Wound Treatment* lessons) the students were more involved in the learning than when the questions were asked with no specific

learning intent (as occurred in the other three lessons).

Assesses prior knowledge of student learning

This form of assessment was used in two of the four lessons observed. The lecturers in the *Insect Collection* and *Soil Water* lessons began their lessons by asking questions to assess prior knowledge. For instance the lecturer in the *Insect Collection* lesson asked questions about the previous lesson on *Insect orders of agricultural importance:*

- *How are insects classified?*
- *Name some examples?*
- *How do the insects benefit agriculture crops?* (Cnr.plp.lo, 16 August 2010).

Although this phase of the lesson was brief, the students' responses helped to establish the context of the current lesson, and to assess whether there was any confusion about the previous topic that required further explanation (Cnr.plp.lo, 16 August 2010). Further the lecturer paused during the explanation to ask questions about what had been covered to that point. The lecturer then very patiently explained again, repeating the procedures, examples, photos and illustrations of the pinning and setting of insects in response to students' questions even after the explanation had been provided earlier (Cnr.plp.lo, 16 August 2010).

In the *Soil Water* lesson, at the beginning of the lesson, the lecturer explained the importance of the topics learnt earlier and asked questions on the *Soil Air* relationship, such as:

- *How do the pores in the soil determine how air is transmitted and retained in the soil?*
- *How does air affect the property of the soil?* (Cnr.ssc.lo, 19 August 2010).

Then the lecturer proceeded to ask the class to think about what the learning outcomes of the lesson might be. The students made attempts to list the LOs as they were mentally prepared by the lecturer's previous questions (Cnr.ssc.lo, 19 August 2010). The questions asked by the lecturer in order to assess prior knowledge helped students

to make connections and establish the context of the current lesson.

The remaining two lessons – *Wound Treatment* and *Chainsaw Tasks and Techniques* - did not use this form of assessment. Instead, in the *Wound Treatment* lesson, the lecturer said that the lesson was a continuation of the previous lesson and began the PowerPoint presentation immediately (Cnr.vts.lo, 18 August 2010). In the *Chainsaw Tasks and Techniques* lesson the lecturer himself recapped the previous lesson, which was about the use of power chainsaws, by reading aloud the contents of the PowerPoint slide (Cnr.forst.lo, 19 August 2010). They did not use questions to generate the same sense of expectation that was observed in the *Soil Water* lesson.

Assessing students' prior knowledge in the beginning and during the lesson was carried out effectively only in the *Soil Water* lesson and to a certain extent in the *Plant Protection* lesson. This promoted thinking in the students, thus increasing the energy and involvement in the classroom.

Resources

In all four lessons, the lecturers used a variety of resources to enhance their teaching. For example, in the *Chainsaw Tasks and Techniques* lesson the lecturer actually brought in a chainsaw to show the students the various parts while explaining the techniques for safety and efficient use in the field (Cnr.forst.lo, 19 August 2010). The students were interested in learning about the chainsaw and it was an appropriate teaching aid for the class. Pictures and photos of various stages of the felling of trees were also displayed in the PowerPoint presentation (Cnr.forst.19 August 2010). Similarly, in the *Insect Collection* lesson, the lecturer produced an insect box and used the PowerPoint presentation to show photographs, pictures, and illustrations of the correct way of collecting, pinning and setting insects in it. The illustrations, sketches, and photos of insects being caught, prepared, pinned, and labelled provided a clear picture of how it was done and were appropriate resources for the lesson (Cnr.plp.lo, 16 August 2010). In the *Wound Treatment* lesson, the lecturer provided photos and chalkboard illustrations as well video clips in order to demonstrate various wound bites and methods of administering anaesthesia which related to the lesson topic (Cnr.vts.lo,

18 August 2010). The lecturer in the *Soil Science* lesson also provided pictures, illustrations, and diagrams of soil structures and processes of adhesion and cohesion for students to observe and to facilitate their understanding.

All of the lecturers used PowerPoint presentations to deliver information about the topic, and all of the classrooms were well equipped with LCD projectors and computers with Internet access. The lecturer in the *Wound Treatment* lesson used the Internet to access video clips showing various wound bites and administration of anaesthesia. Student feedback in the *In-Lesson Questionnaire* supports the observations of the researcher in this regard:

- *Movie clips are shown to clear and understand our doubts on the topic*; and
- *Sir used similar examples of movies to make us get more knowledge,* (Cnr.vts.lq, 18 August 2010).

The physical space was also observed to be fairly conducive of effective teaching and learning activities. The classrooms were spacious and well-equipped with LCD projectors and computers.

However the physical layout of the rooms was impractical for teaching, as four huge wooden pillars painted with Bhutanese designs were situated in the classrooms. This wasted a significant amount of space in the classroom, and the students had to sit in the space within the four pillars if they wanted to view the screen, chalkboard, and the lecturer. In addition, the furniture included the traditional tables and chairs, leading one of the academics to comment:

- *We should have interactive classroom furniture* (Cnr.acs.int, 20 August 2010).

Thus the physical layout of the room, with its pillars and furniture confined the lecturers to the front of the class.

In summary, the lessons included a variety of appropriate resources that enhanced the lecturers' teaching.

Role of teacher

The role of the teacher is explored in the light of the three indicators described in

Creates environments conducive to effective learning

In these four lessons, creation of learning environments was evident in the way the lecturer promoted 'cognitive space'. One of the best examples occurred in the *Soil Water* lesson, which highlighted ways in which the lecturer created an environment conducive to effective learning against many odds. There were 90 students from the three programmes (Animal Husbandry, Agriculture, and Forestry) in the class. Because this large number could not be accommodated in the regular classroom, the class was conducted in the auditorium. Nevertheless, the expectations were clearly stated and the lecturer tried her best to create a climate that motivated students to learn. Using a microphone ensured that the students especially the ones sitting in the back rows could hear the lecturer and walking around the class she made an effort to engage the students in the lesson. The lecturer also involved the students by asking them to state the learning outcomes of the lesson, and by creating a sense of expectation. Her use of humour indirectly helped to arouse the students' interest in learning and also liven up the atmosphere. Moreover as explained in the preceding sections the lecturer involved the students in the lesson by asking questions, which enhanced their engagement in the lesson - an approach that differed from those observed in the other lessons (Cnr.ssc.lo, 19 August 2010). Given the physical constraints of the environment, the lecturer successfully motivated the students for the one-hour lesson. Responses in the *In-Lesson Questionnaire* by the students confirm the observation findings:

- *She really makes class interesting by providing a very well prepared presentations with lots of information on the lesson that she is going to present* [sic];
- *Today's lesson was well planned and the class was well maintained* [sic]*;* and
- *The atmosphere for learning was great* (Cnr.ssc.lq, 19 August 2010).

To a high degree the learning environment of this lesson was one in which students knew what was expected of them and in which they were engaged with the learning tasks by answering questions and taking notes. In the other three lessons, by

contrast, although the classes were held in designated lecture rooms the cognitive spaces were not used to the maximum benefit as they were in the *Soil Water* lesson.

Encourages students to accept responsibility for their own learning and accommodates the diverse learning needs of all students

As *'lecturing'* was the main approach used in the four lessons, not many opportunities were provided to students to accept responsibility for their own learning. However, as mentioned in the preceding section, in the *Soil Water* lesson the lecturer provided opportunities for students to take responsibility for their own learning. By asking questions about the slide information, she prompted the students to think and respond to and explain the content (Cnr.ssc.lo, 19 August 2010). On the other hand in the other three lessons, as described earlier in the teaching and learning approaches (see page xx) the lecturers explained, answered questions, asked questions, cited examples and showed teaching aids to demonstrate the content: the students listened, made notes and responded to questions.

It was observed that the four lecturers made it very clear that the lessons constituted the theoretical input and that the students would eventually have to apply the knowledge and skills in practical sessions. Implicit references were made to take increased responsibility for their own learning. Although this aspect of their learning was not observed, the lecturers' statements and the module plans (Appendix 5.2) suggested that this was what happened. Using this line of argument, it may also be asserted that the students were implicitly being encouraged to take responsibility for their learning in the preliminary theory lessons as the lecturers repeatedly reminded the classes about the practical sessions that were to follow. In an example of this, the lecturer in the *Insect Collection* lesson informed the class that:

- *Practicals will be done in the next class where each one will have to make an insect box after collecting insects in the field*' (Cnr.plp.lo, 16 August 2010).

Similarly in the *Chainsaw Tasks and Techniques* lesson, the lecturer informed the class that:

- *Trees have already been identified and you will have to carry*

out the tasks using the power saw' (Cnr.forst.Lo, 19 August 2010).

However, *accommodating the diverse needs of the learners* was not given priority in the lessons that were observed. The students were all treated in the same way and no extra or special effort was made by the lecturers to cater to diverse learning needs of the students. Those having difficulties for one reason or another were not assisted and neither were those who were more able provided alternatives for study.

Demonstrates an understanding and in-depth knowledge of content and maintains an ability to convey the content to students

All four lecturers demonstrated considerable theoretical and practical knowledge in the lessons they taught. They exhibited in-depth knowledge of the content when explaining, asking questions, and responding to the questions in the lesson, recognising students' efforts in thinking of the responses and by using appropriate resources to enhance student learning. The four lessons used the available technology with well-crafted PowerPoint presentations, and the additional use of video clips in the *Wound Treatment* lesson spoke of their knowledge and understanding of the lesson's content

As mentioned earlier, questions were used to advantage by the lecturer in the *Soil Water* lesson to ensure that students were involved to a greater degree in the lesson. However, in the other lessons, apart from the few questions in the *Wound Treatment* lesson which required students to think (Cnr.vts.lo, 18 August) questions were asked mainly for recapitulation or recall of factual information, which did not challenge the students. In the *In-Lesson Questionnaires* students commented on this lack of challenge:

- *More classroom interactions and group discussions needed* [for the Wound Treatment lesson] (Cnr.vts.lq, 18 August 2010); and
- *Good content knowledge but due to lack of teaching training sometimes it seems very dry with same flow of teaching style* (Cnr.ssc.lq, 19 August 2010).

These comments by the students indicate that they wanted more interaction in the class, and that content knowledge alone was not adequate for teaching.

It can also be seen that the second part of the indicator, ie *maintaining an ability to convey the content to students* was not noted to be effectively implemented in the

lessons as ‘conventional lecture’ was used most of the time, and thus students were not actively engaged with the learning tasks.

When asked during students’ interviews to describe the roles of lecturers, they evidently saw the lecturers as repositories of knowledge, as transmitters of knowledge and facilitators of student learning. They gave the following descriptions based on their experiences:

- *The main role of the lecturer is to pass on subject knowledge by providing more knowledge as what is taught is not sufficient, should give more broad content;*
- *To be actively involved with students in their learning and not make students learn by themselves;* and
- *Encourage me to learn with other students through group work, give me work that makes me think and support me and help me – whenever we approach them for help* (Cnr.stu.int, 18 August 2010).

The lecturers’ comprehensive knowledge of their topics was demonstrated by the manner they taught and explained the topics. The role of the lecturers seen by the students was a combination of teacher and learner-centrednes as they transmitted knowledge to the students as well as encouraged students to learn with others as well as independently.

Role of student

The role of the student is examined using the indicators identified in Chapter Two.

Accepts responsibility for their own learning

The data clearly showed that the students were largely passive learners who listened to the lectures, took notes, and responded to questions. The PowerPoint presentations contained useful detailed content for the students and the lecturers explained each in an equally detailed manner, citing examples, sharing experiences, and reminding them of their application for the practical sessions. It was observed that the students did not ask many questions in the classes, except in the *Insect Collection* lesson in which students asked questions about procedures, such as:

- *How many insects to collect?*
- *How could you avoid damaging the insects while pinning them?* (Cnr.plp.lo, 16 August 2010).

Students were slightly more responsible in the *Soil Water* lesson in which the lecturer asked questions about the PowerPoint presentation, thus prompting students to make meaning of the content for themselves by explaining/answering. In general, however, students by themselves did not take responsibility for their learning and followed what the lecturers had organised for them in the lessons. These characteristics showed the students to be passive learners.

Nevertheless, although the data revealed only limited instances of students taking responsibility for their own learning, it was implicit from the module plans and the nature of the training that the learning situation in the College of Natural Resources was based on contextual learning. Contextual learning, which is reality-based, relates to out-of-classroom experiences within a specific context and in which students have to use their knowledge and skills to build lasting cognitive connections (True, 2002). The nature of the Diploma programmes in the three areas of Agriculture, Animal Husbandry, and Forestry required students to take responsibility for their own learning. This was because they were training to become professionals in technical aspects of farming, forestry, and livestock production, and would later provide quality services for rural development at the grassroots level (College of Natural Resources, 2012). Therefore, although there was limited evidence of this indicator in the theoretical lessons observed, it was implied that students had to take responsibility for their learning.

Actively participates in the class

Since *'lecturing'* was the main approach used in the four observed lessons, there was not much scope for students to actively participate in the class other than respond to questions, ask the rare questions, listen and write notes for the lessons. Examples of lower levels of participation were seen in the *Insect Collection, Chainsaw Tasks and Techniques* and *Wound Treatment* lessons and slightly higher levels in the *Soil Water* lesson in which students answered questions, and contributed to explanation of the

lesson content (Cnr. ssc.Lo, 19 August 2010).

Collaborates/teams with other students

There was no opportunity provided to the students to collaborate or to work in teams with other students. The lessons were used to communicate conceptual information and skills to the students, and required that they listen and understand so they could later apply those skills in the practice.

From the data it was evident that the students were largely passive participants in the lessons.

Summary

The preceding analysis responds to the question: *How do the lecturers implement their prepared plans in a way that supports student learning?* Analysis of the data suggests that the lecturers in the College saw themselves as the knowledge and skills providers in their classrooms. Based on this view of reality, the implementation practices were largely teacher-centred, but with some attempts to use learner-centred strategies. Transmission of knowledge and skills occurred using techniques such as lecturing and giving demonstrations in which the students were observers who occasionally asked the lecturer questions. However the data also showed that the lecturer's resourcefulness could assist students to take some responsibility for their own learning, as seen in the *Soil Water* lesson. The other lessons showed more typical patterns of lecture-dominated teaching with routine questioning to check on student understanding.

Although the above analysis was based on what was observed in the lessons, the frequent references to the practical work in all four lessons provided evidence that there was more to the lessons than was observed. Thus it was understood from the point of view of the lecturers that the real learning took place in the field whereas in the lessons the lecturers merely provided the theoretical input to support the fieldwork for the students. The assessment practices were mainly informal formative, such as asking questions and recapping prior learning but these were used infrequently. The resources

used were relevant to the learning context and the classrooms were well equipped.

The lecturers attended to aspects of the lessons that would enhance student learning by focussing on cultural/religious and scientific values, cautioning about websites and terminology issues, cautioning about care while using the chainsaw, and using the conditions of the local environment while dressing wounds in cattle. This showed that the lecturers related to the workplace experiences and were conscious of preparing the students for them.

Evaluation

The final section of the case study includes an evaluation of the findings of the preceding planning and implementation phases, in order to address the question: *To what extent do the planning and implementation practices of the lecturers support student learning*? Analysis focuses on the same two main issues as in the previous case study: i) the congruence between what was planned for each lesson – as described in the planning section – and what was actually implemented in the lessons – as observed in the implementation section and ii) the impact of these practices on student learning vis-à-vis the seven categories identified in the analytical framework.

Learning Outcomes

This discussion focuses on two issues: i) congruence between the planned LOs and those that were actually implemented to support student learning, and ii) alignment of the LOs with the teaching, learning and assessment. A critique of the construction of the LOs contributes to the discussion.

Construction of Learning Outcomes

One of the key findings regarding the LOs planned by the lecturers is that they were subject-specific, focussing on knowledge and skills which would be required by the students in their future workplaces. None of the LOs planned for the four lessons fell into the personal-generic category.

A significant observation was that the LOs in the two written plans were better developed than the LOs communicated orally in the pre-conference interviews. The

LOs in the written plans were more carefully chosen and were focussed, specific, and well developed (Table 5.1). This gave those lecturers that advantage of being able to match each LO with the lecture/demonstration session in the lessons. In the oral lesson plans there were fewer LOs and there was significant use of general action verbs such as *understand, know* and *get*. These findings reinforce the importance of written lesson plans, the preparation of which provides teachers with time and resources to think through their plans and develop effective LOs.

The application of Bloom's Revised levels of thinking reveals that with the exception of two LOs in the *Chainsaw Tasks and Techniques* and *Insect Collection* lesson, all other 12 LOs prompted only lower levels of thinking (Table 5.1). This suggests that these LOs were not as demanding or as challenging as would be expected at tertiary level. Higher-order LOs those that promote critical thinking, analytic reasoning, problem-solving, or the generation of knowledge viewed as critical for the success of student learning should have been in the lesson and module plans. On the contrary LOs in all four lessons did not satisfy the preceding description but were subject-specific and captured the essence of what *was important for the students to learn* at that level. They represented the underlying knowledge required to apply the relevant skills in the workplace. Besides, since the programme was at diploma level in the three areas of Agriculture, Animal Husbandry and Forestry, it was a realistic requirement of the course (Cnr.fld.nt, 15 - 21 August 2010). The LOs may not have promoted 'deep' learning per se, but provided a practical orientation that was appropriate at the level of studying.

The findings of this case study indicate that inadequately developed LOs have a negative impact on learning, as the LOs do not provide directions for the teaching and learning activities. At the same time, however, the initiative and resourcefulness of a lecturer could also cause some effective learning to take place. This may be explained by the consideration of other factors that according to Kennedy et al. (2006) have a powerful effect in creating a learning environment conducive to active learning. Nonetheless, the LOs in the written plans were relatively well constructed and designed to promote student learning.

Congruence of LOs

Discussion on the congruency of LOs examines the extent to which the intended LOs – those described in the lesson plans – were implemented in the lessons and whether the other LOs which were not planned, but which were implemented during the lessons.

There was general congruence between the planning and the implementation of the LOs. While the intended learning outcomes were implemented as planned in the lessons, the other unplanned 'hidden' personal-generic LOs too were evident that guided the lessons. These unplanned LOs had the effect of enhancing student learning in all four lessons, as they touched upon cultural/religious and scientific values, cautious use of the web for information, safe use of the chainsaw and use of local knowledge. They reflected the spontaneous responses of the lecturers to the situations that arose in the lessons.

As described in the *Insect Collection* lesson, it was observed that the lecturer in balancing the need to collect insects with a Buddhist belief in the sanctity of life, he was clearly sensitive to the cultural/religious reasons for some students not wishing to collect insects and make insect boxes. He rationalised that it was an important part of helping farmers to recognise pests, and therefore save crops. These personal-generic LOs were not included in the lesson plan, but references were made to them during the lesson. By implementing these LOs the lecturer was inadvertently trying to impress upon the students the importance of scientific thinking as well as maintain respect for cultural values. The students appeared aware of the cultural implications the lecturers shared with them in the lessons, with one saying in the *Student Interview*:

- [Lecturers] *help us develop Bhutanese values as well as develop a rational attitude such as during extension communication* [fieldwork] *we have to be aware of the Bhutanese values, learn about different Bhutanese culture and values the farmers practice in their workplace like not rear pigs though it is economically viable because of the religious beliefs; like water shed management in the east* [of the country] *is not done as people believe that the local deities residing in the area will get disturbed and bring them misfortune* (Cnr.stu.int, 18 August

2010).

Thus the lecturer is clearly aware of the importance of sharing ideas with students and making them aware of the cultural issues as well as scientific principles they would encounter in the workplace.

In the *Soil Water* lesson the unplanned LO was related to more academic issues such as using references correctly as the lecturer deemed it important to spend some time during the lesson to make the students aware of such issues.

Similarly in the *Wound Treatment* and *Chainsaw Tasks and Techniques* the unplanned personal-generic LOs were related to workplace requirements and safety conditions.

In summary, the implementation of the unplanned LOs indicated characteristics of learner-centredness. The lecturers showed the consideration lecturers took to assist student learning by providing additional guidelines while searching for resources on the Internet, cautioning about careful collection of insects, showing sensitivity to cultural/religious values, promoting scientific values, exercising extra caution while using the chainsaw, and using the conditions of the local environment while dressing wounds in cattle. This showed that the lecturers related to the workplace experiences and were conscious of preparing the students to become agriculture extension officers, animal husbandry officers and forest rangers.

Alignment of LOs with teaching and learning and assessment

Analysis of data collected in relation to the planning, implementation and evaluation phases indicates that not all the LOs were not well developed in the four lessons. While the LOs in the written plans were relatively well developed, the ones in the oral plans were not. This may be explained by the fact that the teaching and learning approaches were not selected specifically to attain the desired outcomes, and the assessment was not organised to accurately assess student learning. For example, in the *Insect Collection* lesson, although the LOs were *active* ones, which asked students to *explain* and *apply* the various components of *Insect Collection,* the teaching method used was the conventional *'lecture'* and students were not *actively* engaged with

learning tasks. Their main roles included listening to lectures, taking notes, and responding to questions when the lecturer asked them. Furthermore informal formative assessment (i.e. the lecturer asking questions of the students) was not carried out purposefully, but merely to check students' understanding rather than to stimulate further learning. In the two lessons with oral lesson plans, the problems of alignment were further compounded as the LOs were based on *understand*, and *know* which did not inform the teaching learning approaches or the assessment practices in the lessons. The combination of conventional *'lectures'* and inadequately defined informal formative assessment practices, made it difficult for alignment of the three components to occur in the lessons.

In summary, alignment was not strong. As reasoned earlier, the findings must be viewed in the specific context of this College, which offers programmes based on contextual learning. Another extenuating factor was that it was only the theoretical input which was observed. Practical application of what the students learned in the lessons occurred later and these sessions and field experiences were not included in the study. Evidence of the practical work, which would follow, was also found in the module plans (Appendix 5. 2). Nonetheless, what was observed suggested that in relation to alignment, the LOs, and teaching and learning and assessment did not support each other very well.

Teaching and Learning Approaches

In this section, congruence between the teaching and learning approaches that were planned and those that were actually implemented is evaluated in order to ascertain whether student learning was supported in the lessons. The teaching and learning approaches identified in the four lessons made it clear that *'lecture'* was the main approach planned by the lecturers.

In the implementation phases, lectures were conducted as planned, together with Q&As and demonstrations. They lecturers used well-developed PowerPoint presentations to deliver the content to the students. As a result there was congruence between the teaching and learning approaches that had been planned and those actually

implemented. There was both transmission and lower levels of facilitation of active learning in the lessons. As noted earlier, lecturers transmitted knowledge through lectures and facilitated learning by explaining, asking questions (even if only to check understanding) and making resources, such as video clips, pictures, illustrations and diagrams, available to the students.

The planning and implementation practices employed by the lecturers indicated that the lecturers were not very adept at using various components of lecture (Q&As, demonstrations and discussions) very effectively in order to promote student learning. As noted earlier, the contextual learning framework for the Diploma programmes made it necessary to relate the theory lesson to the practical work, as what followed the theory in all four lessons was critical for student learning.

As *'lecture'* was the main approach used students activities in the lesson were restricted to listening, taking notes, observing the demonstrations, watching the video clips and responding to the questions. The level of engagement was not very high for a tertiary classroom in which more active discussions would have been beneficial. Communication that occurred during the Q&As was mainly unidirectional i.e. from the lecturers to the students. No class discussions were conducted to engage the students who seldom asked questions in the class. This finding is consistent with the *Education without Compromise* Report's findings (Education Sector Review Commission, 2008) where teaching and learning typically occur within a culture of passivity, with lecturing being a primary tool. In the staff interview, the following comments justified why lecture might be commonly used:

- *If you have good lecture and illustrations, given the students' background, teacher-centredness would also help* (Cnr.aca.int, 20 August 2010); and
- *Active and deep learning is not possible for both diploma and degree [students] as they are field staff with not a strong educational background* (Cnr.aca.int, 19 August 2010).

There was an exception to this: one lecture-based lesson, although not an exemplary interactive lesson, was more interactive than the other three. The *Soil Water* lesson was one of the best examples observed throughout this case study, with the

lecturer creating an environment moderately conducive to effective learning. She used Q&As effectively; involving the students in the lesson, and effectively having them take responsibility for their learning instead of 'spoon-feeding' them.

Comments from students in the *In-lesson Questionnaires* for the lessons clearly indicated the need for more interaction, and active engagement in the class:

- *More classroom interactions and group discussions needed* (Cnr.vts.lq, 18 August 2010, Wound Treatment lesson);
- *More reaction* [sic] *from students should be done so that students can learn more themselves* (Cnr.forst.lq, 19 August 2010, Chainsaw Tasks and Techniques lesson); and
- *If the learning method can be of more good quality and of related field* (Cnr.plp.lq, 16 August 2010, Insect Collection lesson).

It also became apparent that they sought more practical than theoretical sessions:

- *It would be good if there is more practical than theory* (Cnr.ssc.lq, 19 August 2010, Soil Water lesson);
- *The lesson should be related to practical work/field work* (Cnr.forst.lq, 19 August 2010, Chainsaw Tasks and Techniques lesson); and
- *Need more practicals* (Cnr.vts.lq, 18 August 2010, Wound Treatment lesson).

These comments regarding students desire for more practical work correspond with the requirement of their future workplaces, and reflect the fundamentally practical nature of the Diploma programmes in the College in which practical application in the field would be the real test of student learning. The students commented that the lecturers mainly presented information on-screen using PowerPoint presentation, chalkboard and the OHT and lectured, but also asked questions (Cnr.int.stu, 18 August 2012). Thus it is clear that lectures were commonly used in the lessons.

Content Knowledge

In this section congruence between the content that was planned and that which was actually implemented in the lessons, is examined to ascertain effects on enhancement of student learning. Observations for this study were made purely on the

lecturers' incorporation of content into the lessons.

Content knowledge was observed to be one of the strengths of the lecturers in the College. Further, the lecturers were particularly conscientious about delivering the materials that they planned for the lessons. This strength likely arose came from the lecturers' field experiences, qualifications (doctoral and masters degrees in their respective subject discipline) and several years teaching experience in the college (College of Natural Resources, 2012). The lecturers' expertise in their respective subject areas was demonstrated by their preparation of highly detailed and informative PowerPoint presentations with appropriate diagrams, pictures, and photographs.

Observations made in relation to the depth and breadth of lesson content suggested that the *Wound Treatment* lesson covered a great deal of content for the allotted time period (Cnr.vts.lo, 18 August 2010). Content in the other three lessons appeared to fit the length of the lesson comfortably.

In the *In-Lesson Questionnaire,* students commented on the content coverage, and relevance to their learning:

- *Plant Protection is a new subject and interesting topic and the lesson in the topic are so challenging and interesting* [sic] (Cnr.plp.lq, 16 August 2010);
- *The lesson was related to Bhutanese context* (Cnr.forst.lq, 19 August 2010), for the Chainsaw Tasks and Techniques lesson;
- *The theory and practicals lessons taught in the class are appreciated* [sic] (Cnr.vts.lq, 18 August 2010), for the Wound Treatment lesson;
- *To supplement more on his subjects he even screens us video clips for particular topics* (Cnr.vts.lq, 18 August 2010). For Wound Treatment lesson;
- *Lecturer really makes the class interesting by providing a very well prepared presentations with lots of information on the lesson* (Cnr.ssc.lq, 19 August 2010) for Soil Water lesson; and
- *Good content of knowledge* (Cnr.ssc.lq, 19 August 2010) for Soil Water lesson.

The students' comments suggest that they acknowledged and appreciated the content being conveyed to them.

As previously noted, content knowledge is important for a teacher to have, but what is more important is to know how to teach it (D. L. Ball et al., 2008). Even though the four lecturers prepared conscientiously, only when content is taught effectively will it become meaningful for the students. This lack of Pedagogical Content Knowledge (PCK) and thus the skills for teaching was evident in the way that these lessons were taught; they were lecture-dominated and although questioning was used, it was not very skilfully adapted for the lessons. The College is cognisant of the lack of pedagogical skills among the academic staff, and had made efforts to provide training workshops for the lecturing staff:

- *Crash courses (up to one week) to new teachers on teaching-learning methodologies (pedagogy) either with the help of Paro College of Education or by the senior staff of the College itself. Also the new teachers are encouraged to attend/observe classes facilitated by senior staff. The effectiveness of such trainings is sometimes questionable* (S. Trashi, personal communication, 8 December 2011).

Although the majority of lecturers have rich field experiences and are highly qualified in their discipline, they are not trained teachers. In an effort to professionalise the teaching and learning practices at the College, training workshops had been organised but, as noted in the personal communication above, ascertaining their impact on teaching is difficult to assess. Analysis of data suggests that there is congruence between content knowledge in the planning and implementation phases and that this supported student learning to a large degree.

Assessment

This section examines congruence between the assessments that were planned and what was actually implemented in the four lessons and evaluates the extent to which the assessments supported student learning. Informal formative assessment was the most common method of assessment used by the lecturers in order to evaluate student learning.

Assessment strategies planned for the lessons included asking questions of students at the beginning of the lesson to make the link with the previous and current

content taught and summarising the lesson at the end. These practices of assessing prior learning at the beginning of lessons and summarising during lesson closures were both carried out as planned in the implementation phase. But not all the lessons had both types of informal assessment implemented in their lessons.

Questions were also asked during the lessons to check students' understanding at different stages and clarify matters about which they had doubts. In some lessons (e.g. *Chainsaw Tasks and Techniques*), questions were routinely asked to check students' understanding, and as a way of creating some interaction, whereas in others (e.g. *Soil Water* and *Wound Treatment)* they were asked in order to simulate students to think, and to contribute to discussion of the content, hence prompting them to take some responsibility for their own learning.

Although all lecturers asked questions in order to assess student learning, the manner in which they asked and the follow-up took place varied, and clearly impacted upon student learning. In the *Insect Collection* lesson the patient and repeated explanation of content, procedures, photos and illustrations of the pinning and setting of insects were evidence of informal formative assessment. This assessment served to prepare the students for the subsequent practical class in which each one would have to make an insect box after collecting insects in the field (Cnr.plp.lo, 16 August 2010).

On the other hand in the *Chainsaw Tasks and Techniques* lesson, although the lecturer was attentive and paused in his lecture to ask questions (such as *Have you understood what has been explained so far?)* of the students (Cnr.forst.lo, 19 August 2010), they were not specific. Thus they had the effect of creating classroom interaction rather than enhancing the learning experiences of the students. In such a scenario, deep learning is unlikely to have taken place. In the *Soil Water* lesson, on the other hand as noted earlier, the questions were asked for a specific purpose on specific subtopics in the lessons and challenged them rather than just checking whether students understood what was taught. This lecturer went beyond questioning to support informal formative assessment of students' learning and used questions with much more sophistication than the other lecturers.

On the basis of the *lesson observations* and *In-Lesson Questionnaires* it was difficult to establish whether the use of informal formative assessment helped to make any difference to student learning. As students' only involvement was listening and responding to questions, there are no outcomes of activities or students' questions to provide evidence of successful learning. The observations indicated that there was limited congruence between the assessment that was planned and the assessment strategies that were actually implemented and the potential benefits of informal formative assessment were not realised in the lessons.

In summary, in lessons in which some kind of informal formative assessment took place, student learning was supported to a moderate degree than in lessons in which informal formative assessment was not used effectively. To some extent, the LOs guided the assessment practices; but it was also observed that although the LOs were not well developed, the use of questions as assessment in the *Soil Water* lesson was successful, indicating the influence of other factors.

Resources

In this section congruence between the resources mentioned in the planning phase and those actually used in the implementation phase, is explored. The impact of the use of these resources on student learning is also examined.

There were a variety of resources employed in the four lessons. In the planning phase, the written plans (for the *Insect Collection* and *Wound Treatment* lessons) included lists of resources. On the other hand, the lecturers for the two oral lesson plans – *Chainsaw Tasks and Techniques* and *Soil Water* noted the use of a chainsaw and PowerPoint presentation respectively. In the implementation of the lessons, additional resources, such as the chalkboard were included.

The resource-rich College is equipped with a well-functioning library with expanding facilities and services, and a modest collection of books, well-equipped computer laboratories (115 computers in three laboratories and the classrooms) with 2mbps bandwidth, wireless service with 7-8 Omni access points for 24 hour Internet access. The classrooms are equipped with LCD and overhead projectors and computers

with Internet access which were used by the lecturers to their advantage. As observed by one of the academics:

- *Now I see the changes happening in our way of teaching from blackboard to OHP and now ICT based teaching and learning* (Cnr.acs.int, 19 August 2010).

which reflected the development of teaching resources for teaching in the College.

Taking advantage of the well-established functioning ICT facilities, lecturers created suitably-crafted PowerPoint presentations that detailed lesson content. The PowerPoint slides were a good source of content and since they were well-developed and included pictures, photographs, illustrations, diagrams, and video clips they formed a significant resource for student learning. The hard work of the lecturers in designing and developing the slides was evident. PowerPoint presentations allowed lecturers to use technology for the transmission of information. The students' comments about use of resources in the *In-Lesson Questionnaires* confirmed the effectiveness noted by the researcher:

- *Uses all teaching materials required;*
- *She prepares visual aids to make us understand more;*
- *Movie clips shown are clear and understand our doubts on the module* (Cnr.vts.Lq, 18 August 2010);
- *The lesson was well prepared on how to handle chainsaw;* and
- *He is always contended* [sic] *with his teaching materials* (Cnr.forst.Lq, 19 August 2010)

The use of resources had a positive impact on student learning as students became familiar with the various ways to identify and treat wounds, different technical terms and processes and procedures for safe chainsaw use.

The use of resources is identified as one of the strengths of the College. The nature of the courses required a lot of resources to be used in conjunction with the knowledge and skills of the lessons. Without the pictures, photographs, diagrams, illustrations, and real objects such as the chainsaw, the lessons would not have been as beneficial for the students as the techniques, concepts and processes would have remained in abstract form. The resources utilised by the lecturers brought reality into

the classroom and helped students to prepare for the practical component of the Diploma programmes in their respective fields.

The classrooms as physical spaces were adequately furnished and well-equipped to support teaching and learning in the College. However the layout of the classroom, which included obstructive pillars, was an impractical use of space, and a hindrance to creative utilisation of the space. As remarked by one of the lecturers:

> *The classroom layout with pillars is a waste of space* (Cnr.acs.int, 20 August 2010).

Additionally, although the College was well resourced, library resources which would have benefitted student learning were either unavailable or inadequate. Lecturer comments indicated their awareness of this College shortcoming:

- *Students do not have access to references for specific subjects as there are very few copies and the students' numbers have increased* (Cnr.aca.int, 19 August 2010); and
- *There is very little or no information on horticulture even on Bhutan which makes it difficult to cite example and bring the reality to the classroom* (Cnr.aca.int, 20 August 2010).

The inadequacy of the College library resources represents another, less positive aspect of the situation, and one, which the lecturers responded to by using the Internet:

- *However the use of Internet has made it easy for students to access information from the various websites;* and
- *Right now we are more dependent on online materials* (Cnr.aca.int, 20 August 2010).

As it was the lecturers who prepared the handouts, uploaded them on the Content Management System (CMS) and directed students to websites, the students considered them to be significant learning resources. The use of the CMS as a resource in the College had both benefits and drawbacks. On the positive side, the students could access the handouts and lecture notes available and therefore could come prepared for the lesson. The lecturers could upload information prior to the lessons.

On the other hand, since the CMS was a relatively new concept in the College and despite encouragement to use it, it had some adverse effects on student learning. Its usage appeared to result in considerable 'spoon-feeding' of students. Students' ready

access to the lecturers' PowerPoint presentations, handouts and other links on the CMS webpage for the module seemed to discourage some students from making notes in the class. It appeared that student participation in the lesson was reduced by availability of resources online since they could access the relevant information in the CMS. The CMS could support student learning if the students used it well for interaction and discussion in the class and not simply as a repository of lesson notes. The nature of the Diploma programmes and the dearth of reference materials doubtless contributed to such practices. Additionally, the expectation that lecturers would use the CMS to replace lesson plans was a premature expectation. An examination of a module on the CMS as noted in the Planning phase, revealed that it was essentially a repository of content material for the module, and information on the assessment. Because modules on the CMS did not include lesson plans they could not be said to replace those plans. The role of the CMS seemed more related to module content rather than describing ways that lessons should be taught.

Role of Teacher

In this section the role of the teacher in the planning and implementation phases is evaluated to ascertain their role in support of student learning.

Observation of their lessons indicated that lecturers were essentially seen as planners, organisers, and implementers with the responsibility of deciding on the content, write and arrange for resources to support the lessons. They planned their lessons moderately well and organised resources for the lessons. Even the ones who did not have written plans organised those lessons, giving them some thought, albeit to a limited extent. As they were experienced teachers who had taught the modules for some time, they were familiar with both the content and structure of the lesson. They had well-developed mental constructs of the lessons which was evident from the ease and confidence with which they conducted their lessons.

The lecturers arranged resources for use in the lessons and had well-developed PowerPoint presentations to guide and transmit content to students. The manner in which the PowerPoint slides were prepared spoke of thoroughness and commitment. In

relation to the use of PowerPoint for teaching, one staff member commented:

- *I am comfortable using the PowerPoint presentation in the class as it's fast and easy, but preparation is time consuming* (Cnr.acs.int.20 August 2010).

The fact that the lecturers had lesson plans – in written or in oral form - indicated support for student learning. Observations made of the four lessons indicated that the lecturers essentially employed a mixture of teacher and learner-centred strategies. While teacher-centredness was predominant in all the lessons with '*lecture'* as the chosen mode of teaching, the lecturers had also made some efforts to encourage students to think by asking questions (e.g. *Soil Water* and *Wound Treatment* lessons), demonstrating procedures (e.g. Wound *Treatment* lesson), and using information-rich PowerPoint presentations and a variety of teaching aids to enhance learning (e.g. chainsaw, insect box). In the *In-lesson Questionnaires* for the four lessons, students expressed their appreciation of the efforts made by the lecturers:

- *Lecturer teaches well and I am happy to be her student. Could understand well whatever she teaches us. I appreciate her work (Soil Water* lesson, Cnr.ssc.lq, 19 August 2010);
- *Lecturer explains well with good communication skill and some good materials (Insect Collection* lesson, Cnr.plp.lq, 16 August 2010);
- *Lecturer has planned and organised well with good communication, professional knowledge, and attitude (Chainsaw Tasks and Techniques* lesson, Cnr.forst.lq, 19 August 2010); and
- *I would overall say he has excellent way of teaching, whatever input are given everyone of us could understand (Wound Treatment* lesson Cnr.vts.lq, 18 August 2010).

These comments provide evidence that although *lecture* was used in all four lessons, the lecturers provided extra support for student learning.

However, as discussed in *Role of teacher* in the implementation phase, students communicated their desire for a more active type of learning in their lessons. Correspondingly, lecturers articulated some of the difficulties they faced while teaching

and why they sometimes thought it was better to use teacher-centred approaches:

- *We need to teach the subjects so that we can be more efficient in delivery of these services which are skill based –i.e. to handle or operate machines, animals, crops;*
- *Institute like ours offer courses which are practical based and it calls for a lot of resources and facilities to be created. Therefore teaching sometimes becomes more theoretical and teacher-centred. This will help us the staff as we are not trained as teachers. Most are professional graduates or from Ministry of Agriculture. Teaching as a career is not for them. They have to be trained otherwise they will become just theorists*;
- *I try to use learner-centred approaches. Sometimes students complain about the detailed information and want superficial knowledge, as they are just school graduates. Students are bit lazy to look for information, so they lose interest. I download all my PowerPoint presentations on the College Management System for students to access and use;* and
- *The idea is good to encourage active and deep learning as the students will learn and understand everything for themselves. But practically, its difficult because of the students' background as they don't have that kind of learning experience. So we have to use it with caution, start with primary education in our schools and it will become more challenging at the college level- when they reach the college* (Cnr.aca.int, 20 August 2010)

These comments provide useful information about the teaching and learning practices adopted by the lecturers. The students' background and level of interest, the lecturers' background and experience, and possibly more significantly the nature of the programmes influenced the lecturers' decision to use '*lecture'* as their main teaching approach. They recognised the benefits of the using more active teaching and learning approaches but were constrained by numerous factors, including their own professional background and lack of teacher training.

The lecturers' comprehensive knowledge of their topics demonstrated by the manner they taught and explained the topics perhaps compensated for their lack of pedagogical skills. Their strong work ethic was also evident in the approach to their work, their organisation, and their preparation of lessons and resources.

In summary, the lecturers' role was largely 'transmitter of knowledge and

skills', although they also facilitated learning through their lesson preparation and delivery. Analysis of the research data indicates that the lecturers were considerate, and conscientious about their teaching and about helping students to learn. They showed enthusiasm and interest and were able to effectively convey the lesson content to the students. It is significant that the lecturers were aware of the lack of Pedagogical Content Knowledge (PCK) in their teaching and the College had made efforts to organise training programmes to address this lack. These factors point to the progressive attitude of the lecturers and the college in general, in their undertaking to enhance student learning in the College.

Role of student

There was little evidence in any of the four lessons to suggest a direct role for the students in the planning phase. The assertion that could be implied is that since learning outcomes were developed by the lecturers, the focus of the lessons was on student learning and not the lecturers' teaching.

In the implementation phase, the role of students was reflected in their behaviour in the lessons. Data from the lesson observations indicated that students were attentive or passive listeners; some (though not all) took notes, and some responded to questions; very rarely students asked questions of the lecturer.

Data from the lesson observations showed that the students spent approximately 80-85 % of the time listening, observing, answering questions, and taking notes, which on the whole was not intellectually demanding. The remaining 15-20% was spent responding to questions asked by the lecturers. A parallel can be drawn with the lecturers' role, with 80-85% of the lesson time spent explaining, demonstrating, posing questions to the students, and 15-20% listening to students' answers. Exceptions which challenged the students to think a little more deeply and which prompted them to take responsibility for their own learning, occurred in the *Soil Water* lesson and to a some extent in the *Wound Treatment* lessons.

Students were observed to be heavily dependent on the lecturers and on the resources available for their learning and as noted earlier there was considerable 'spoon-

feeding' of students. The use of CMS as discussed above did not make the learning situation better. It was observed that ready access to content information lead to considerable spoon-feeding. The use of PowerPoint presentations in the lessons further exacerbated the situations as the PowerPoint presentations reinforced linear representation of information, and students were not provided with opportunities for interaction. Exley and Dennick (2004, p. 126) point out that the use of visual aids is associated with very different classroom dynamics and student expectations, and students find it virtually impossible to interrupt the lecture with questions because of the formality that they bring to the setting. The use of PowerPoint presentations, then may explain why students did not ask questions.

The body language of the students in the lessons was another indicator of the roles of students in the class. For example, some students were leaning forward, sitting up straight and looking at the lecturer or the slides, while there were some who were clearly disengaged from the lessons. These behaviours were observed in all the lessons, as there were some students who were genuinely interested in learning while others were disengaged from the lesson.

Additionally the behaviour of the students and feedback in the *In-Lesson Questionnaire*s confirmed the culture of passivity in students' learning. When the lecturer attempted to shift the learning responsibility to the students (as observed in the *Soil Water* lesson), the students reacted negatively and commented in the *In-Lesson Questionnaire* that they were not happy with teaching-learning arrangement (Appendix 5.4). The comments registered their discomfort, when the lecturer put pressure on the students to think and answer. In the *Wound Treatment* and *Insect Collection* lessons, however, the lecturers did not provide handouts nor give extra time for students to copy the PowerPoint presentations, but in these lessons the students did not complain. This seems to reflect the students' attitudes of not wanting to be pushed out of their comfort zone.

Conversely in lessons where they were not required to take responsibility for their learning, but listen passively to the lecturer, the students praised the lecturer and commented very positively about the lesson. For example in the *Chainsaw Tasks and*

Techniques lesson, the students extolled the capabilities of the lecturer and the learning that occurred, making such comments as:

- *Our lecturer is a knowledgeable person. I can say that he is very intelligent; he is absolutely excellent on his job. He is the best lecturer in the college;* and
- *Lesson was very impressive, informative and learning objectives were clearly fulfilled* (Cnr.forst.lq, 19 August 2010).

What was observed was not an 'impressive' lesson. This suggests that students may lack awareness of what constitutes 'active' and 'deep' learning, and of value of classroom 'interaction'. Students seemed to associate questions asked by the lecturer during the lesson as promoting interaction and perhaps active learning. Therefore the comments by the students in the *In-Lesson Questionnaire*s have to be considered carefully. This caution is supported by research that finds a common misconception that students have about the process of learning is that a good lecture is always clear, and that all arguments will appear clear and logical (Zirbel, 2008, p. 5). In contrast to listening passively, *thinking is hard work*, and unfortunately many students are reluctant to think deeply about a problem. Kirkwood (2010) asserts that a culture of passivity permeates much of tertiary education as the pace of the student's life - extracurricular activities and the change in the world at large - compete with their studies for attention. Students at CNR, therefore may, like young people everywhere, be grappling with the problems described by Kirkwood (2010) which make it difficult for them to be active learners in the class. This is clearly exacerbated by personal learning histories in Bhutan.

In general, lecturers were of the view that students were not ready for deep and active learning as they explained that the students' educational background included no experience of active learning and that they were training to become field staff for whom practical knowledge was is extremely important. It was also said by the academic staff that students were 'a bit slack' in their approach towards learning, as indicated by the following:

- *I give them reading assignment, which is to read and discuss. Students find it difficult to read as students cannot understand the text in the books so it's something, which they must work*

on; and

- *Sometimes students complain about the detailed information and want superficial knowledge as they are just school graduates* (Cnr.acs.int 20 August 2010).

These factors may well have motivated lecturers to provide extensive resource and learning support to the students through the CMS. The lecturer's comments did not portray a very positive image of the students but these seem to be the realities of the situation. The students enrolled in programmes were high school graduates and came from an educational system where teacher-centredness still prevailed. Bringing about attitudinal changes towards learning would take time, and would perhaps result in demand for more learner-centred teaching with deep and active activities. Students also need to be exposed to such activities in order to change their learning behaviour.

Summary

Examination of data in this section has helped to evaluate the planning and implementation of the lessons and find out whether what was intended was also implemented. In doing so, the research question: *To what extent does the planning and implementation practices of the lecturers support student learning*? has been addressed.

Based on this analysis, it can be concluded that there was a combination of types of support for student learning. To a large extent, the approach was teacher-centred, as lecturers played the central role in planning and implementing the lessons. The use of '*lecture'* as the main approach to teaching further reinforced teacher-centredness. On the other hand, the efforts to facilitate student learning by challenging students through questions, creating an environment conducive to effective learning, and preparing and organising resources demonstrated some learner-centred practices. The lecturers' dedication and experience in planning and implementing the lessons were also viewed as indicators of learner-centredness.

Planning in the College was found to be largely guided and influenced by the Module plans (Appendix 5.2) which were developed and written by the lecturers themselves. Planning wavered between student- and teacher-centered practices. The presence of learning outcomes in both the module and lesson plans indicated learner-

centred practices although some needed to be fine-tuned to satisfy the SMART criteria. Adam (2008, p. 15) notes that development of LOs takes time and reflection as their creation and implementation is a highly complex and difficult process. It seems clear that the lecturers at the College of Natural Resources require more time and training to write LOs that address the needs of both lecturers and students.

Teaching and learning approaches were largely dominated by *'lectures'*, which helped to deliver the content in an efficient and speedy manner. The particular learning context which prevailed (i.e. that the theoretical lessons were preludes to subsequent practical sessions) made this appropriate, as it was important for the lecturers to provide sound foundational knowledge to the students before they attempted the practical sessions. Students viewed '*lecturing'* was as an appropriate approach at tertiary level because their learning experiences in high school had not exposed them to, or prepared them for alternatives such as active and deep learning strategies. Although the four lessons were lecture-based, there were some variations observed in how they were conducted. The way lecturers conducted the classes made a big difference in the learning. On occasions when some forms of active learning (such as questioning) took place, some deep learning were observed to occur, In lessons in which ' *conventional lecture'* was the predominant teaching strategy, passive learning was observed to take place.

The use of technology in teaching, (such as PowerPoint presentation, and the Internet), was one of the strengths of the College's academic culture. However use of PowerPoint presentations could have contributed to the lessons being more teacher-centred as these presentations tend to be more linear in organisation and do not encourage interaction.

Assessment methods observed in the lessons were mostly informal formative practices using questions; however these were not utilised very effectively for the enhancement of student learning. They were used to help lecturers to check whether the students had understood the lesson but the questions were not always used to stimulate or provoke deep learning or higher levels of thinking.

Student passivity was also observed as a common feature in the classes. The students were quite passive unless compelled to be more engaged, a situation that was observed in the *Soil Science* lesson. It was observed that even when opportunities were presented for students to ask questions or to initiate discussions they remained passive participants; it is possible that students do not have the skills to be active learners.

Perhaps at least partially as a consequence of the students' passivity, the lecturers relied heavily on the conventional '*lecture'* format for their teaching. The practical components of the courses provide activities for the students, thus the lecturers may have felt absolved from the need to provide active, interaction-based teaching in the classes. To conclude a comment made by one of the lecturers' interviewed captures the essence of the College's teaching-learning culture:

> *The teaching-learning in this college has evolved and improved over the years. This campus has always had nationals right from the beginning – so it has a very strong Bhutanese flavour. Therefore our T/L approaches are slow and realistic guided by our own way of thinking and doing. The disadvantage is that there is little or no outside perspective which could have enhanced the learning environment here* (Cnr.aca.int, 19 August 2010).

Therefore it could be said that given the circumstances and constraints, student learning was supported moderately in the four lessons. There were, however, possibilities to make the planning, implementation and evaluation practices much more supportive of student-centered learning.

Conclusion

In this chapter, planning, implementation, and evaluation practices in the College of Natural Resources have been explored and through evaluation attention drawn to the key findings of the practices. The data and subsequent analysis suggested that there were some moderate levels of active learning happening in the classrooms despite the dominance of the transmission, teacher-centred approach. In the next chapter, the third case study, that of the College of Science and Technology (CST), is discussed.

Chapter Six: College of Science and Technology

Introduction

Situated at an altitude of approximately 400m above sea level at the base of the Himalayan foothills, the College of Science and Technology is located on a hilltop in Rinchending, a five hour drive from Thimphu and about ten minutes drive from Phunetsholing, the western gateway to Bhutan (RUB, 2010). The proximity of the College to Phuentsholing town has advantages as it is a thriving commercial centre on the northern edge of the Indian plains, and has a rich combination of Bhutanese and Indian culture.

Although the college began functioning as the College of Science and Technology in 2006 (College of Science and Technology, 2010), its history dates back to the late 1960s when the Don Bosco Jesuit priests ran a Technical School (Paul, 2009), which later became the Royal Bhutan Institute of Technology. The Institute provided training for tradespeople such as plumbers and electricians for several years. In the early 2000s, due to security problems in the south-eastern part of the country, the Royal Bhutan Polytechnic, which had been situated in Dewathang in the south-eastern part of the country, was temporarily shifted to Rinchending (C. Dorji, personal communication, 4 February 2012). The Polytechnic was responsible for training middle level technical officers. With the temporary inclusion of the Royal Bhutan Polytechnic, the two institutes consolidated their training programmes and in 2001 introduced Bachelor degree programmes in Civil and Electrical Engineering. In 2003 it became a constituent member of the Royal University of Bhutan and in 2005, the Royal Bhutan Polytechnic was returned to Dewathang and renamed the Jigme Namgyal Polytechnic. The Royal Technical Institute was upgraded, renamed the College of Science and Technology, and retained the degree programmes on its campus (C. Dorji, personal communication, 4 February 2012). In its role as a member of the RUB, the College is responsible for promoting tertiary education in the field of science and technology.

The College presently offers Bachelor degree programmes in Electronics and Communications Engineering and Information Technology as well as Civil and the

Electrical Engineering. In addition to these programmes, the College conducts short-term in-service training programmes, workshops and courses for civil servants, particularly for technical professionals (College of Science and Technology, 2010). The College aspires to:

> *Be a centre of excellence in science and technology* and aims *to create an environment to foster growth of intellectually capable, professionally competent, ethically sound and innovative professional technical personnel who will be able to contribute to the development of Bhutan and in particular to the growth of Science and Technology in the country* (College of Science and Technology, 2012).

The College has a team of well-qualified and committed faculty, and relatively good laboratory resources. The Library is stocked with 13,000 books, journals and other learning materials (Cst.lib.int, April 2010). Internet connection is provided by a leased line of three mbps from Bhutan Telecom Ltd and is available to all the staff and students 24 hours each day (Cst.it.int, April 2010).

In 2010, there were 375 students across the three programmes. The students enrolled in the Civil and Electrical Engineering degrees come from backgrounds that include success in Class XII and a strong science background (College of Science and Technology, 2010).

A total of 53 academics teach in the College's programmes; 11% hold PhDs in various areas such as civil engineering, power electronics, and nuclear physics, while 45 % have master's degrees in various areas of engineering, 42% have bachelor degrees and the remaining 2% have postgraduate diplomas. Figure 6.1 shows the staff profile by qualification. For a university there is a considerable number of staff that holds only bachelor degrees, a matter that is being addressed, as enrolment of these staff in higher degrees over the next few years is a requirement of the RUB.

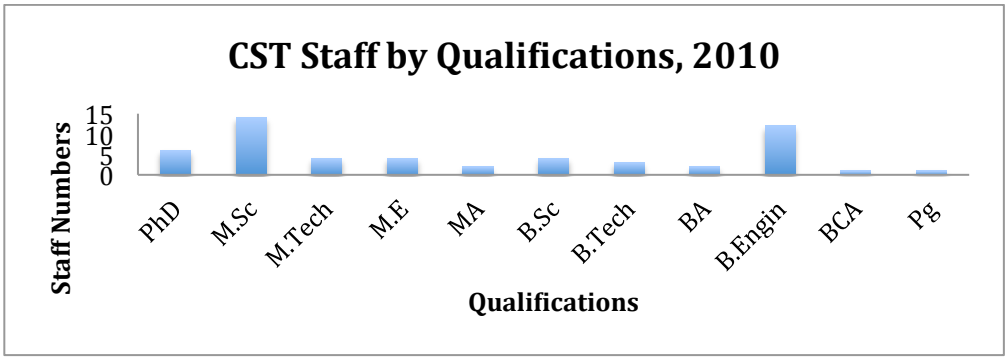

Figure 6.1. – College of Science and Technology Staff by Qualification, 2010 (RUB, 2011)

Figure 6.2 shows the staff numbers across the four subject departments in the College. The Electrical Engineering Department has the most staff with 22 lecturers whereas the Information Technology has only six. The Bachelor degree programme in Electronics and Communication and the Bachelor of Engineering in Information Technology degree were launched in 2009 and 2010 respectively necessitating an increase in staff numbers as students progress through the course and enrolment numbers increase. The Humanities and Science Department is one of the oldest departments, having been established in 1972. The Department does not offer any courses in Science or Engineering but looks after the common subjects for Civil, Electrical and Electronics & Communication degree programmes such as Mathematics, Physics, Chemistry, Environment, English and Dzongkha.

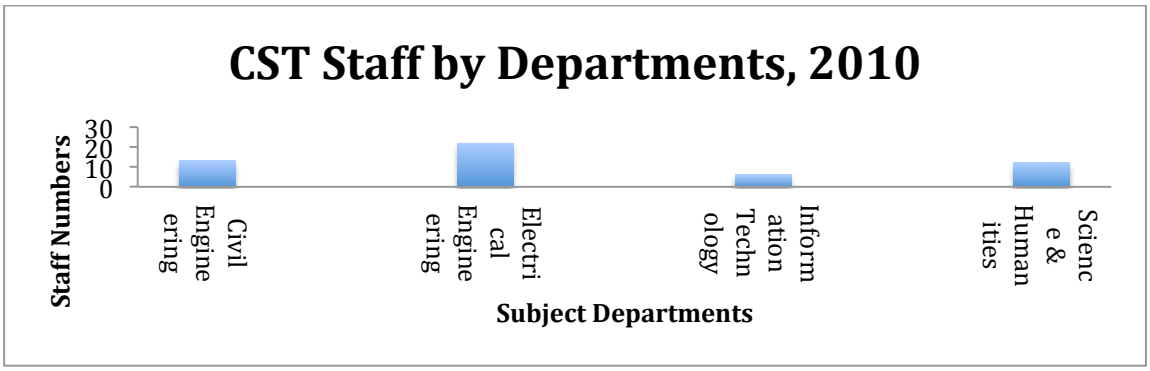

Figure 6.2. – College of Science and Technology Staff by Departments, 2010 (RUB, 2011)

In the coming years the College plans to double its current student strength (2011) of 384. The College introduced a Research and Technology Transfer Unit, which is one of the Components of **SASEC IH** (South Asia Sub-regional Economic Cooperation International Highway) project funded by Asian Development Bank (2011). Staff in the Unit will carry out empirical studies and create new avenues of growth such as training and consultancy. The college plans to offer three new programmes Bachelor in Engineering in IT, Bachelor in Engineering in Architecture and Planning and Masters in Engineering in Hydropower. The College already has well developed links with engineering colleges in India, EU countries, and Canada, all of which have provided substantial support for the College in its curriculum development.

Since becoming part of the RUB, CST has created a reputation for itself. During the annual admissions period, students with good results in science subjects and who intend to pursue careers as engineers apply to the College as their first choice. The first edition of the College Newsletter noted that the "College of Science and Technology today stands second to none in terms of dedication, productivity, innovation and commitment to meet modern technologies and standards" (College of Science and Technology, 14 March 2011).

It is against such a background that this case study examines the nature of teaching and learning practices in the College of Science and Technology. The data has been organised using a similar framework to that employed in the previous three case studies, viz., Planning, Implementation and Evaluation phases.

Planning

Although there were written *module* plans, written *lesson* plans were not in use in the college. The absence of written lesson plans indicated that lesson plans were not mandatory and certainly not common practice in the College. As a result when lesson plans were requested, lecturers provided module plans. The general trend was to use the Module descriptors which present a comprehensive picture of the lecturers' and students' engagement for the entire semester (Appendix 6.1).

Although written lesson plans were absent, there was some evidence of

planning which became evident during the pre-conference interviews with the lecturers. The lecturers of *Seismic Engineering* and *High Voltage Generation* lessons made clear their intention to use PowerPoint presentations while the lecturer responsible for the *Linear Control Robotics* lesson said he had notes which he referred to while teaching. The content notes and PowerPoint presentations indicated some form of planning though not in an explicit way.

Although teachers did not have written lesson plans, all readily described mental plans of their lessons. Livingston and Borko (1990) described such mental plans as typically including a general sequence of lesson components and content, but not details such as timing, or pacing the exact number of examples and problems, which was the case for these three lecturers.

It is these mental constructs that will again be used as the unit of analysis in this case study. In the following discussions, these lesson plans are explored in an attempt to understand the planning practices of lecturers in the College, and thus to address the research question- *What is the nature of lecturers planning that lecturers engage in as they prepare for their lessons?* The module plans however, will sometimes be included in the analysis as they guided the planning of lessons and contained useful data.

Learning Outcomes

In this case study, as in the previous two, learning outcomes (LOs) planned by the lecturers are examined using the SMART criteria. To begin with, since the three lecturers had *thought of LOs*, suggested that student learning had been at the forefront while thinking about the lesson.

Specificity

Using the specificity criteria, the LOs for the lesson plans were examined in order to identify types and levels of thinking according to Bloom's Revised Taxonomy (Anderson & Krathwohl, 2001). Table 6.1 illustrates the *Specificity* criteria that were identified.

Table 6.1. Types and Levels of Thinking in the Learning outcomes across the three lessons

	Lesson	**Examples of Learning Outcomes**	**Type**	**Level of Thinking in the Bloom's Revised Taxonomy**
1.	Seismic Engineering (Cst.eqe.lo, 12 April 2010)	*Understand how to analyse seismic force*	Subject-specific (Knowledge-based)	Understanding
		Interpret the result of seismic force	Subject-specific (skill-based)	Understanding
		Analyse using both software and manual calculations of seismic force on building structures	Subject-specific (skill-based)	Analysing
2.	Linear Control Robotics (Cst.iro.lo, 13 April 2010)	*Understand clearly the concept of Linear Control Robotics*	Subject-specific (Knowledge-based)	Understanding
		Apply the concepts learnt from the demonstrations with confidence	Knowledge & Personal-generic	Applying
		Acquire knowledge for the Quiz No. 3 (to be held later in the week)	Personal-generic	Remembering
3.	High Voltage Generation (Cst. hve.lo, 13 April 2010)	*Understand the concept of high voltage generators for different voltage values*	Subject-specific (Knowledge-based)	Understanding
		Become familiar with the models of high voltage generators	Subject-specific (Knowledge-based)	Remembering

The LOs in Table 6.1 show a strong focus on the technical subject area. Engineering and technology degrees tend to be highly structured, with programmes biased towards the acquisition of knowledge (Project Based Learning in Engineering,

2003). This accords with the traditional view of teaching engineering described by Svedberg (2011). Yet, it is important to have a broader set of learning outcomes, which would include personal-generic LOs, in addition to technical knowledge and ability, on which the engineering schools traditionally focused. Two personal- generic LOs were included in the *Linear Control Robotics* lessons while the other two lessons did not include LOs in this category. Even in the module plans the LOs had a strong subject-specific focus, reflecting the widespread orientation of the LOs towards the content areas of the subjects.

However the use of *understand* and *become familiar* in the *High Voltage Generation* lesson and *understand* in the two lessons, raised the problem of using non-specific action verbs, words which did not indicate what had to be done/demonstrated by students to show they had understood or learnt to articulate the level of attainment. Use of such non-specific action verbs could be open to multiple interpretations, and therefore are not specific.

A mixture of lower and higher levels of thinking was included in the LOs, with 63% (N=5) focussed on lower levels of thinking (Table 8.3 in Appendix 8.1). Although a higher percentage of the LOs were based on lower levels of thinking, the LOs were subject-specific and a prerequisite in the context of the lessons. Nonetheless there were some examples of LOs that had effective and practical higher levels of thinking such as *apply* and *analyse*.

In summary, the LOs in this case study were by and large subject-specific, with some examples of personal-generic LOs in one lesson and with a higher incidence of lower levels of thinking. The recurring problem of using *understand* and *become familiar,* both non-specific action verbs according to the SMART criteria, persisted in this College too.

Measurability

In some cases the LOs were measurable, whereas in others they were not (Table 6.1). Examples of measurability was seen in two LOs of the *Seismic Engineering* lesson, - *Interpret the result … and Analyse using both …* (Cst.eqe.lo, 12 April 2010)

and in the *Linear Control Robotic* lesson the LO *Apply the concepts* ... (Cst.iro.lo, 13 April 2010). This was because the students could carry out the actions listed in these three LOs in the lessons. On the other hand, in the *High Voltage Generation* lesson both LOs were not measurable (Table 6.1) as they did not contain specified actions for the learners to perform. Uses of *understand* in LOs for each for the *Seismic Engineering* and *Linear Control Robotic* lessons were not measurable either.

The LOs in the three lesson plans were not written consistently in terms of measurability.

Achievability

Some of the LOs designed for the lessons were achievable as they were stated clearly and realistically. Examples of LOs that were achievable were *Apply the concepts* ... in the *Linear Control Robotics* lesson (Cst.iro.lo, 13 April 2010), which stated clearly what the students were to do to demonstrate their learning. Similarly, *Analyse using* ... and *Interpret the result* ... in the *Seismic Engineering* lesson (Cst.eqe.lo, 12 April 2010) were well defined and achievable. They were within the range of capabilities of the students who would be able to *apply*, *interpret* and *analyse* the tasks listed in the LOs. On the other hand, the LOs using non-specific terms such as *understand*, which were observed in all three lessons, were not well defined and therefore their achievability was in doubt. There were, therefore, inconsistencies in the LOs with some fairly well expressed as achievable outcomes and others not clearly articulated. Similar patterns were seen in the LOs for the module plans; an indication that practices in developing LOs was not consistent.

Relevance

The LOs for the lessons were relevant to the learning context and the workplace of the students as they were studying to become civil and electrical engineers. It was important for them to learn about high voltage generators for different voltage values and recognise the different models of high voltage generators in the *High Voltage Generation* lesson; learn how to analyse seismic force and use the information to calculate the seismic force on building structures in the *Seismic Engineering* lesson, and

in the *Linear Control Robotic* lesson to become conversant and apply the concepts on linear control robotic mechanisms.

Time-scaled

The LOs for the three lessons were each planned for one-hour classes and were therefore time-scaled. The *Seismic Engineering* and *Linear Control Robotics* lessons had three LOs each, and the *High Voltage Generation* lesson had two – all possible within the timeframe.

To summarise the LOs that emerged indicated how the lecturers prepared for their lessons. Some of the LOs in the three lessons were specific, measurable, achievable, relevant, and time-scaled while others were ambiguous and did not follow the parameters for learning outcomes. The LOs that emerged suggested that the lecturers understood the fundamental principles of LO but were not conversant in developing effective LOs.

Teaching and Learning Approaches

This section explores the teaching and learning approaches planned by the lecturers for the lessons. This analysis is based on the indicators identified in Chapter Two.

Organises active/passive engagement with learning tasks

During the pre-conference interviews, each of the three lecturers said that they were *going to present information* on specific topics. This suggested that 'lectures' were to be used to engage the students, and suggesting passive engagement of the students. However the *Seismic Engineering* lecturer also said that she would use the code manuals IS -13920 and 1893 and Computer Aided Design software (Cst.eqe.lo, 12 April 2010) while teaching, and get students to analyse implying that some active engagement tasks with the manuals and software were intended during the lessons. Other than this example, 'lecture' was identified as the main approach planned to be used to teach.

However it also became clear that 'tutorials' were used in conjunction with lectures (these were not observed) in which students were asked to discuss their doubts, and ask questions about the lecture (O. Kafley, personal communication, 14 April

2010). Tutorials promote some level of active engagement for students to read, talk, write, interact, describe, question, listen and reflect on the information and materials presented in the lesson. Beyond this information, which came out during informal conversations, there was little in the oral plans that might suggest engagement of students with learning tasks.

Provides opportunities for interaction amongst students and with the lecturer

Opportunities for interaction did not appear in any of the lesson plans. The lecturers did not share any information during the pre-conference interviews that described how the 'lectures' would be conducted – whether they would be simply conventional 'lectures' or interactive sessions with activities and discussions. This may, however, be more appropriately demonstrated in the implementation phase.

Initiates vigorous and critical interaction with subject content (invokes deep learning)

The lesson plans did not carry much evidence of this indicator either, although the inclusion of *analyse* and *interpret* in the *Seismic Engineering* lesson and *apply* and *acquire* in the *Linear Control Robotics* lesson suggests some kind of interaction with the content. No evidence of interaction emerged in the third lesson *High Voltage Generation,* as its LOs, were framed using non-specific action verbs such as *understand* and *get familiar* (Table 6.1).

In general, the data showed that the main approach towards teaching and learning planned for the lessons was 'lecture'- based.

Content Knowledge

In this section the depth, breadth and relevance of content planned for the three lessons is examined. Discussions are based on what was observed and understood when the lecturers referred to the content of their lessons during the pre-conference conferences. For the *Seismic Engineering* lesson, the lecturer said that she would teach about seismic force, how to interpret it and that she would then get the students to analyse it using the manual and software (Cst.fld.nt, 11-17 April 2010). Similarly in the *High Voltage Generation* lesson, the lecturer explained that he would teach about high

voltage generators for different voltage values (Cst.fld.nt, 11-17 April 2010). In the *Linear Control Robotics* lesson the lecturer said that he would teach some problems on the topic (Cst.fld.nt, 11-17 April 2010).

With reference to content relevance, the content of all three lessons appeared to be focussed and appropriate related to the students' future workplaces and would be useful for them. The content of the lessons was evidently in accord with the modules, which were within the context of the programmes leading to degrees in civil, and electrical engineering awards (Appendix 6.2). The data indicated that the breadth and depth and relevance of the lesson content were satisfactorily planned.

Assessment

This section addresses the degree to which the lecturers select, construct and utilise appropriate assessment strategies.

During the pre-conference interviews for the three lessons, the only lecturer to mention assessment was the one who taught the *Linear Control Robotics* lesson. He said that he would conduct a quiz on what was taught but that was to be conducted later in the week (Cst.fld.nt, 11-17 April 2010) suggesting the use of summative assessment. There were no details communicated about assessment in either of the other two lessons. More detailed information about informal formative assessment needs to be carefully considered in the implementation phase of the lessons.

Module plans contained greater detail about assessment, and indicated extensive summative assessments (Appendix 6.1). These included semester-end examinations, and continuous assessment with assignments, closed class tests, case studies, and quizzes throughout the semester.

A significant aspect of assessment employed by the lecturer who taught the *Linear Control Robotics* lesson was the use of quizzes conducted at regular intervals in lieu of assignments. The lecturer responsible for the module said that *he did not consider assignments as a good way of assessing students' learning as they would simply copy and paste the information from the references and websites on the assignments.* He further explained that *after the quiz, he always shared the results with*

the students and provided feedback on their performance (F.Chen, personal communication 13 April 2010). This suggested both summative and formative assessment as providing feedback would help the students to improve and perform better in the next quiz while the scores would inform them of their performances.

Resources

Resources planned for the lessons are examined to assess the effectiveness of the use and variety of resources in the enhancement of learning and teaching. During the pre-conference interviews, the lecturers who taught the *Seismic Engineering* and *High Voltage Generation* lessons said that they would use PowerPoint presentations in the lessons. The *Seismic Engineering* lesson lecturer said that she would also be using Manuals S-13920 (Ductile Detailing of Reinforced Concrete Structures Subjected to Seismic Forces – Code of Practice) and IS-1893 (Criteria for Earthquake Resistant Design of Structures) which included standards to guide the design and repair of buildings under seismic forces and the software Computer Aided Design (CAD) for the analysis and interpretation of seismic forces, as lesson resources. On the other hand, the lecturer responsible for the *Linear Control Robotics* lesson did not report plans to use any resources in the lesson.

Reading lists were the only resources listed in module plans (Appendix 6.1). It was noted that the books were fairly recent publications contrary to the books listed in the modules from the other two colleges analysed so far. Other than these print materials, which were small in number, other resources such as websites, software programmes and laboratory equipment for the practical work were not mentioned. Given that the programmes prepared the students to become civil and electrical engineers, the practical component of the modules would require equipment for the application purposes, but there was no evidence of their inclusion.

Role of Teacher

As in the previous two case studies, the lesson plans were created with the teacher playing the central roles, and as the main decision-makers. They were responsible for development of the LOs, for the teaching and learning approaches, for

deciding content topics and assessment strategies and for organising the resources to ensure implementation of the lessons.

Role of the Student

There was little to show that there might be a role for the students during the planning phase, an indication of the passive role that students play as mere recipients of what the lecturers planned.

Summary

This section has addressed the question: *What is the nature of lecturers planning that lecturers engage in as they prepare for their lessons?* It is significant written lesson plans were not common practice in the College. Their absence indicates a lack of understanding of the differing levels of planning required for programmes. Although module plans were designed to guide the lesson plans, they *were not* the plans to be used for the lessons themselves. The College had relatively well-developed module plans that covered the essential components of modules, such as learning outcomes, teaching and learning approaches, assessment, and resources, indicating that planning at module level was well established.

The LOs provided information on the types and characteristics of learning outcomes developed by the lecturers in the College. The LOs addressed the SMART criteria to some extent, but failed at times to use appropriate action verbs to indicate what they wanted students to do in the lessons. There was a mixture of LOs, which required high and low levels of thinking, with a higher percentage in the lower levels. The LOs were mainly subject-specific. Little attention was given to assessment generally, with summative assessment evident in one of the three plans. Resources planned for use were mainly PowerPoint presentations, and in the case of the *Seismic Engineering* lesson, code manuals and software were also included.

In summary, the planning practices were mixed in that inclusion of LOs which adhered to the requirements of the *Wheel* implied a learner-centred approach; the teaching and learning approaches were, however, based on the conventional 'lecture'

method, suggested a teacher-centred approach which paid little attention to assessment.

Implementation

In this section data from the study is used to answer the research question *How do the lecturers implement their prepared plans in a way that supports student learning?* The seven categories identified in the analytical framework (Chapter Two) that play a role in the implementation of the lesson plans shall be examined.

Learning Outcomes

The discussion addresses what learning outcomes were evident during implementation phase.

It was observed that the LOs planned by the lecturers for the three lessons were all implemented with the lecturers pursuing them during the lessons. For example, in the *Seismic Engineering* lesson, the three LOs listed in Table 6.1 *Understand how to analyse ..., Interpret the result …* and *Analyse using both ...* (Cst.eqe.lo, 12 April 2010) were achieved with the lecturer explaining and demonstrating ideas and activities, and asking students to work on a calculation that analyses the seismic force on a building structure using CAD and the manuals. Similar patterns were observed in the other two lessons, with the lecturers ensuring that the LOs were achieved by explaining, demonstrating and asking questions. However, as all the students were not actively participating in the lesson, it would be difficult to assess whether *all* the students had achieved the LOs that the lecturers had set for the lessons

Additionally in the classroom the teacher may work towards LOs unconsciously delivering more than was originally planned. Such unplanned LOs were observed in all three of these lessons. For example in the *Linear Control Robotics* lesson, the lecturer conveyed his expectations to the students on punctuality and taking responsibility for learning to the students. He started his class on time, exactly at 8 am even though there were only three out of the fifteen students in attendance (Cst.iro.lo, 13 April 2010). Furthermore, before the lesson proper began, the lecturer spent a few minutes on management issues and reminded the class about the College rule of 80% attendance requirement in the module and asked the students present to remind their absent

colleagues about it.

In the *High Voltage Generation* and *Seismic Engineering* lessons the hidden LOs were not so evident since both the lessons were theory-heavy, they were compactly presented. Nonetheless the lecturer's amiable and approachable disposition in the *High Voltage Generation* lesson (smiling often) hinted at the importance of a cheerful and positive relationship to promote and encourage student learning. On the other hand, in the *Seismic Engineering* lesson, the lecturer's apparent involvement in *teaching* the lesson, made her oblivious of the students' behaviour of the students sitting at the back of the class. One student slept through the second half of the lesson and others showed signs of restlessness.

In summary, there were additional LOs, which focused on norms and principles (Giroux, 2001) besides the planned LOs that were implemented in the three lessons. While the planned LOs were subject-specific, the unplanned LOs were of the personal-generic type. Lecturers in two of the lessons enhanced the learning experience of the students, by obliging them to take responsibility for their own learning and by the creation of a cheerful and positive atmosphere in the class.

Teaching and Learning Approaches

Data from the lesson observation records, students' *In-Lesson Questionnaires*, student and staff interviews and field notes contribute to an understanding of the teaching and learning approaches that in the three lessons. The same set of categories and indicators utilised in the earlier case studies will be used as a framework to examine the teaching and learning approaches.

Organises active/passive engagement with learning tasks

The most common teaching approach in all three lessons was 'lecturing'. The lectures were delivered using PowerPoint presentations (in the *High Voltage Generation* and *Seismic Engineering* lessons) and the chalkboard (in the *Linear Control Robotics* lesson). In addition to 'lectures', questions, demonstrations, and brief problem-solving activities were part of the teaching repertoire.

Differing levels of engagement were observed in the three lessons. In the *High Voltage Generation* lesson, students listened passively during the PowerPoint presentation, with the slides presented and explanations provided by the lecturer. The lecturer provided explanations of the contents of slides and then asked questions of students in order to assess what they may have understood, they responded to the direct questions only, but in doing so, demonstrated a slightly more active level of engagement. The same procedure was followed for all ten slides – explanation followed by questions (Cst.hve.lo, 13 April 2010). The level of engagement increased a little when the lecturer asked questions about numerical problems related to high voltage generators for different voltage situations such as for *simple voltage doubler, cascade voltage doubler, and multiple circuits* (Cst.hve.lo, 13 April 2010). By this part of the lesson, the students had *warmed up to the lesson and responded with more enthusiasm and interest* making them visibly more active (Cst.hve.lo, 13 April 2010). Although this was a significant episode in the lesson, it took place only towards the close of the lesson, during the final 5-7 minutes (Cst.hve.lo, 13 April 2010).

In the *Linear Control Robotics* lesson, the lecturer used questions in order to actively engage students during his explanation of the content. For example he wrote a problem on the board and instead of providing the answer or solving it himself, he asked questions through which he got the students involved in solving the problem (Cst.iro.lo, 13 April 2010). However as the students were rather reticent during the lesson, they provided answers only to the questions asked. Even when the lecturer gave them problems to solve on their own, the students quietly and separately worked on the problems. However, signs of nonverbal cues such as facial expressions, nodding, listening attentively, and leaning forward were observed among the students throughout the lesson. The students made copious notes, apparently writing down everything the lecturer wrote on the board or explained to the class (Cst.iro.lo, 13 April 2010). These indicated the students' interest in the lesson and/or their desire to not miss anything. The moderately active learning strategies utilised by this lecturer, such as assigning problem-solving tasks to students, getting them to find the solutions, and then on completion, share their findings involved students in a much more active way than

simple passive listening.

The majority of the students (85%) agreed that the lecturer encouraged them to participate in the lesson, while 15% thought that the engagement level was acceptable (Cst.iro.lq, 13 April 2010). Further comments in the *In-lesson questionnaire* such as:

- *This lesson is interesting*; and
- *Good in planning the lesson for teaching and following it accordingly, have great professional knowledge*

verified students' interest in and engagement with the lesson.

In the *Seismic Engineering* lesson, the lecturer did not ask questions in the same way as lecturers did in the other two lessons. Instead she demonstrated the procedures of the Computer Aided Design (CAD) software to calculate seismic force on building structures, and then assigned a problem to the students to *calculate the seismic analysis of force acting upon different floors of a building* (Cst.eqe.lo, 12 April 2010). However, since proper instructions for the problem-solving activity were not provided, some of the students worked on the problem, while some waited for their friends to complete and they copied the solutions, whilst some waited for the lecturer to write it on the board and yet others waited for the lecturer to come around and explain the procedure (Cst.eqe.lo, 12 April 2010).

Thus the levels of students' engagement varied across the lessons. When it was mainly content that was being conveyed, students listened passively or attentively and took notes. Whereas when questions were asked, demonstrations conducted and brief problem -solving tasks assigned, the students became more actively engaged with the learning tasks.

Provides opportunities for interaction amongst students and with the lecturer

Opportunities for interaction with each other and with the lecturer were few, given the manner in which the lessons were organised. The lecturer directed the interactions in the classroom and the predominant form was with the lecturer asking questions to the students as described above. The students were confined to listening,

observing, and assimilating information; and there was no interaction between the students themselves. In the *Linear Control Robotics* lesson, the students interacted only with the lecturer even when they were assigned problems to solve; they were not asked to consult with each other during the problem solving activity (Cst.iro.lo, 13 April 2010). Similar patterns of interaction were observed in the *High Voltage Generation* and *Seismic Engineering* lessons, with few opportunities provided for interaction with other students. Additionally in the *Seismic Engineering* lesson, the lecturer also had one-on-one interaction with students when she went around the class during the activity to *calculate the seismic analysis of force acting upon different floors of a building* during which she explained, and encouraged the students to complete the calculations (Cst.eqe.lo, 12 April 2010).

Overall, interaction amongst students in the classes was low with the most seen in the *Seismic Engineering* and lesser variations in the other two lessons. Students did not engage in active discussions with each other or the lecturer as would be expected in tertiary level engineering degree classes. This was because the lecturers did not provide much opportunity in the lessons for discussions.

Initiates vigorous and critical interaction with subject content (invokes deep learning)

Interaction with subject content was seen in varying degrees across the three lessons. In the *Linear Control Robotics* lesson, the lecturer created opportunities for the students to interact relatively vigorously with the subject content when he sought to involve the students in explaining the procedures for problem solving using the linear control robotic formulae. The students were asked to solve problems themselves first, using one of the methods and then the lecturer would demonstrate the second method and ask them to compare the two (Cst.iro.lo, 13 April 2010). The approach employed by the lecturer allowed the students to interact with the content of the lesson to a reasonable extent and thereby promote some degree of deep learning. In the *Seismic Engineering* lesson too, the lecturer attempted to have the students interact with the content of the lesson by assigning them problems to solve after she had provided a demonstration example. As clear instructions were not provided, however, the level of

interaction with the content was variable with some students working on the problem and others simply waiting for the lecturer to come around to explain while others simply copied from their friends (Cst.eqe.lo, 12 April 2010).

In the *High Voltage Generation* lesson, interaction with content was slightly lower as the lecturer simply asked questions of the recall or comprehension type to recapitulate what was taught in the lesson. But, towards the close of the lesson questions on applying numerical problem-solving formulae related to different high voltage situations prompted moderately enthusiastic class interaction with the content (Cst.hve.lo, 13 April 2010).

The lecturers in this College mainly used direct instruction methods to teach, focussing specifically on content and the tasks students were required to perform. Kroesbergen and Van Luit (2003) describe direct instruction as a very systematic step-by-step format requiring student mastery at each step. It is a highly- structured lessons in which teachers present material to students in an explicit way, rather than having them attempt to arrive at conclusions on their own (Cavanagh, 2004, p. 4) as observed in this case.

In summary, opportunities for interactions varied although in some the direction was only from the teacher to the students. In the *High Voltage Generation* lesson approximately 90% of the time was spent on teacher explanation and approximately 10% on interaction, during which the lecturer asked questions and students responded (Cst.hve.lo, 13 April 2010). On the other hand in the *Linear Control Robotics* lesson, interaction between the teacher and students took approximately 15% of the lesson (Q&As), with another 30% for problem solving activity and the remaining 55% devoted to teacher talk (Cst.iro.lo, 13 April 2010). In the *Seismic Engineering* lesson, approximately 40% of the class time was spent on interaction of which 10% was taken up by the demonstration; teacher talk occupied the remaining 60%. These show a prevalence of highly structured lessons a characteristic of direct instruction.

Content Knowledge

The relevance, depth, and breadth of content taught in the three lessons are now

examined.

Depth and Breadth of content

Observations of the three lessons showed that the depth and breadth of content varied. In the *High Voltage Generation* lesson, whose content included concepts of high voltage generators for different voltage values, ten PowerPoint slides with methodically prepared text, diagrams, and pictures of AC/DC Impulse, generation of high AC voltage, models of generators were presented to the class (Cst.hve.lo, 13 April 2010). The content input was adequate for the purpose of the lesson, which was to provide theory about different voltage values and models of high voltage generators.

In the *Seismic Engineering* lesson, the content focussed mainly on the practical application of the manual codes and software in order to calculate seismic force on building structures. The calculations enabled students to calculate the seismic force. The lecturer demonstrated a few examples of mathematical problems using the manual codes and the CAD software and then the students applied the calculations to a problem assigned to them (Cst.eqe.lo, 12 April 2010). The lesson consisted of adequate depth and breadth for the topic and enabled the students to become acquainted with the theory and problem-solving activity.

Similarly in the *Linear Control Robotics* lesson, the content depth and breadth were satisfactory as the main part of the lesson consisted of explanation of the theory and problem-solving using the formulae provided (Cst.iro.lo, 13 April 2010).

Links content to other subject areas and everyday life of students

The content in the lessons was linked to the practical work of the students and to the jobs they would be expected to work on completion of the degree programmes. For example in the *High Voltage Generation* Lesson, the lecturer made references to the hydroelectric plants in Bhutan and the voltage generators used in them. Similarly in the *Seismic Engineering* lesson, the lecturer made reference to the work situation where engineers were required to build earthquake resistant buildings in the country, as earthquakes are frequent in the Himalayan belt. In the *Linear Control Robotics* lesson,

the lecturer, however, made no such reference throughout the lesson.

Assessment

The methods of assessment employed by the lecturers in the three lessons are examined using the indicators identified in Chapter Three.

Selects, constructs and utilises appropriate assessment strategies (formative and summative)

In the lessons, informal formative assessment, such as asking questions in order to review the students understanding of the information taught and checking the work done by the students was the main form of assessment. However, there were varying degrees in its usage. In the *High Voltage Generation* lesson, questions were asked to review students' understanding of the information that was taught. The lecturer asked students questions at regular intervals during the lesson to find out whether they understood what he had explained in relation to each slide (Cst.hve.lo, 13 April 2010). The questions simply required students to recall information that was presented earlier in the class, but asking questions had the effect of making the classroom conversation more like a dialogue than a monologue. It was only towards the end of the lesson the lecturer presented some higher level thinking problems as described above.

Questioning was used more efficiently in the *Linear Control Robotics* lesson, in which the lecturer involved the students in generation of the steps and the creation of solutions to the problems he wrote on the board. As the questions were built into the lesson, the lecturer could check the students' understanding, and provide further information or clarification as necessary. The lecturer was observed demonstrating both simple and complex procedures in order to solve problems, and advising students to approach them in simple and straightforward ways. He also used analogies to explain the concepts behind the problems to further clarify (Cst.iro.lo, 13 April 2010). In this way, the lecturer both assessed and guided the students' learning informally. However, his announcement that a quiz covering what he had taught to date would be held the following week was evidence of assessment that was both summative (because marks were awarded) and formative (because detailed feedback was provided on the students'

performance so that they could improve the next time) (Cst.fld.jr, 11-17 April 2010).

On the other hand, although the lecturer in the *Seismic Engineering* lesson did not use questioning as a means of evaluating students' understanding, she did assess students' understanding informally while they were involved in the problem-solving task. She monitored the students while they were performing the calculations, checking, explaining the procedures, and responding to their questions (Csteqe.lo, 12 April 2010). However as explained earlier, activity was not well organised and students were not given clear instructions, monitoring was not very effective as the lecturer spent a lot of time with some students explaining the procedures. Some enterprising students organised themselves, discussing and solving the problems together. Others waited for the lecturer to write the steps and solutions on the board and yet others copied from their friends. Therefore, although the opportunity was available to provide constructive informal assessment, the lecturer did not carry it out successfully. Moreover it was observed that she mostly interacted with students sitting on the first row of the class, which had the effect of excluding the rest of the class (Cst.eqe.lo, 12 April 2010).

Assesses prior knowledge of student learning

Prior knowledge was assessed during various stages in the lessons when the lecturers made references to previously learnt content and asked questions or made students apply them to their current learning. In the *High Voltage Generation* lesson, the lecturer recapped previously learnt concepts of high voltage generation to solving mathematical calculations. However, this was done towards the close of the lesson and was not very effectively conducted as the lecturer provided all the information himself. Similarly in the *Linear Control Robotics* lesson the lecturer referred to prior learning and asked questions but here the lecturer expected the students to apply the concepts to the problem-solving task. In the *Seismic Engineering* lesson, the lecturer made frequent references to previously taught concepts and asked students to apply the principles to the problem-solving activity.

Resources

There were few resources used in the three lessons, with the lecturers mainly

using the LCD projector and the whiteboard to transfer information and to demonstrate mathematical problems. Manuals and software was also used in one of the lessons.

In the *Seismic Engineering* and *High Voltage Generation* lessons, the lecturers used the LCD projector and white board. These were used particularly well in the *Seismic Engineering* lesson, with the whiteboard used for the calculations and the LCD projector to demonstrate the use of the software. The lecturer also used the *Manuals S-13920 (Ductile Detailing of Reinforced Concrete Structures Subjected to Seismic Forces – Code of Practice) and IS-1893 (Criteria for Earthquake Resistant Design of Structures)* and standards for calculation and interpret seismic forces. Because the software had already been installed in the computer before the lesson, the lecturer was easily able to move from the manual calculations on the whiteboard to demonstration of the software on the LCD without any waste of time. The flexibility of this arrangement also brought some variety of resources to the students in their learning experience (Cst.eqe.lo, 12 April 2010).

In the *High Voltage Generation* lesson, the lecturer used the LCD to project the ten slides of his PowerPoint presentation that set out the lesson content and diagrams and pictures of models of high voltage generators. The PowerPoint was well developed and contained relevant information for the lesson (Cst.hve.lo, 13 April 2010). The lecturer in the *Linear Control Robotics* lesson, however, used the whiteboard extensively to demonstrate the calculations and explain the content. He used it systematically, writing neatly, which the students found useful as they copied everything he wrote on the board (Cst.iro.lo, 13 April 2010). Additionally the lecturer used his notes as a resource during the lesson, a matter commented on by students on the *In-Lesson Questionnaire:*

> - *This lesson would be much helpful if there is more resources for learning. Due to lack of resources we are failing in our part to understand but he manages by making notes* [sic] (Cst.iro.lq, 13 April 2010)

implying that the lecturer's notes were potentially useful as a resource for student learning.

In addition to the content resources, the physical space was observed to be fairly conducive to teaching and learning activities. The classrooms were large and well ventilated with fans (as the College is located in the subtropical Southern Foothills of the Himalayas). The classrooms were not equipped with LCD projectors or computers so it was necessary for lecturers to bring and set them up before each lesson, which they did for the *Seismic Engineering* and *High Voltage Generation* lessons. The use of resources was modest throughout the lessons and main approach to teaching was transmission of information by electronic means and using manuals, which do not require many resources.

Role of Teacher

The role is studied within the framework of indicators described in the Literature Chapter.

Creates conducive learning environments

In the three lessons observed, the lecturers and students used the cognitive spaces differently in terms of expectations and the creation of motivational climate. For example in the *High Voltage Generation* lesson, the lecturer's expectations regarding classroom rules and procedures were familiar to the students based on previous experience in his classes. His creation of a motivational climate was especially evident in the lesson, as the lecturer's disposition was friendly, warm, and approachable and he smiled often during the lesson which appears to have made the students comfortable. When the students did not answer his questions; the lecturer provided the answers himself and did not pressure the students. He also used humour in the lesson to diffuse the awkward moment that followed his inquiry about whether the students had any questions, saying:

- *either all of you have understood everything very well or nothing at all.*

In response, the students all nodded to indicate that they had no questions (Cst.hve.lo, 13 April 2010). The students' comments in the *In-Lesson Questionnaire* confirmed the observation findings:

- *He always teaches well, so good. He always comes prepared what is going to teach & give nice demonstration also* [sic]*;*
- *As usual he plans and organise his teaching appropriately with good communications skill having right attitude towards teaching and also towards students* [sic]; and
- *Though this subject is purely theoretical and some time creates a monotony but the respective tutors tries to explain at his best, he has great knowledge about the particular subject he is teaching* [sic] (Cst.hve.lq, 13 April 2010).

However some observed that the lesson was a little different from his usual classes:

- *Before this lecture, he didn't use projector, he use to write on the board and dictated. Instead taught us by notes;*
- *Today lecturer used LCD for explanation;* and
- *Usually lecturer used to use the white board"* (Cst.hve.lq, 13 April 2010).

Based on the feedback received from the students, it might be assumed that the lesson had been specifically prepared for observation. However several other comments provide a counter-argument to such an assumption:

- *lesson is taught in similar to the previous session [sic];*
- *no change* (Cst.hve.lq, 13 April 2010).

The combination of students' comments and the researcher's observations led to assumption that the lecturer's lesson differed from his normal practice only in his use of PowerPoint.

As mentioned earlier, in the *Linear Control Robotics* lesson the lecturer had very clear expectations laid down, spending a few minutes in the beginning and the middle of the lesson (when the latecomers had joined class) on management issues related to attendance. He handled this in a very professional manner and made it clear that the students were responsible for their own learning and behaviour. The students appeared to understand the expectations and behaved accordingly. On the subject of creating a motivational climate in the class, it was observed that the lecturer was

professional in his conduct, beginning the lesson exactly on time irrespective of the number of student attending the class. When the stragglers came in he did not question or berate them for their tardiness, but went on with the lesson. This mature manner of the lecturer prompted the students to reflect on their responsibility and to act accordingly. The lecturer was also observed to be very patient and approachable while teaching and encouraged students to ask him questions. He attempted to inject humour in the lesson while demonstrating mathematical problems, by posing question such as *"Who am I*?" and leaving blank spaces on the board where the answer should be written (Cst.iro.lo, 13 April 2010).

The student comments in the *In-Lesson Questionnaire* generally corroborate the researcher's observations:

- *He had framed just enough materials to be taught within an hour, he has well planned course to conduct the class*;
- *He is very sincere and hardworking, also he have good professional attitude and knowledge;*
- *He came on exact time as always and left the class at exact time;* and
- *Everything is relevant in subject matters and teaching methods* (Cst.iro.lq, 13 April 2010)

The students also commented on other aspects that threw additional light on the lecturer's role. For example;

- *In previous lesson there was more of class interaction, this is lacking in today's session* (Cst iro.lq, 13 April 2010).

Observations and student comments suggested that the earlier lessons were more interactive than the one observed, which suggested that not all the lecturers had prepared the lesson for the purpose of observation.

In the *Seismic Engineering* lesson, the lecturer was very involved in her teaching, and maintained a serious demeanour throughout the lesson. As in the other lessons, students appeared to be familiar with the expectations of the lecturer and behaved accordingly – listening, responding, solving problems and making notes. The lecturer used the time well, sharing the lesson content with students, demonstrating

manual calculation using the codebooks and the CAD software to analyse the seismic forces on building structures. She also had a planned problem-solving activity for the students and despite the lack of clear directions, most of the students worked well (cst.eqe.lo, 12 April 2010). Comments on the student *In-Lesson Questionnaire* revealed the motivational aspect of the lecturer's teaching, for example:

- *The lesson was made more lively today, well organised, audible and more understandable* [sic]; and
- *It was well organised and well planned lecture* (Cst.eqe.lq, 13 April 2010).

There were other comments from the students, such as:

- *Usually, the lecturer is not audible and those of us sitting at the back cannot hear her*; and
- *This particular lesson was well organszed and very well prepared* (Cst.eqe.lq, 13 April 2010).

implying that special efforts had been made to prepare the lesson for observation. The lecturer was observed to speak rather softly and to interact mostly with students in the front row, so the ones at the back of the class could not hear her properly and thus felt neglected (Cst.eqe.lo, 12 April 2010). A second set of comments on the lesson suggested that the lesson did not differ from earlier ones. For example:

- [lesson] *found out to be similar to the previous class*;
- *All was similar*; and
- *Pre-planned and well organised all the time* (Cst.eqe.lq, 12 April 2010).

Such contradictory comments made it difficult to arrive at a decision regarding whether or not the lesson was typical of her teaching.

Encourages students to accept responsibility for their own learning and accommodates the diverse learning needs of all students

Not many opportunities were given to students to take responsibility for their own learning in any of the three lessons that were observed. However, as discussed earlier in the *Linear Control Robotics* lesson, the lecturer placed the responsibility on the students for their own learning, specifically with regard to his clearly expressed

expectations regarding class attendance and punctuality. He also involved students in the calculations by asking them to provide the steps and explanations (Cst.iro.lo, 13 April 2010).

Similarly in the *Seismic Engineering* lesson, the lecturer assigned the class the problem-solving task of analysing seismic forces on building structures (Cst.eqe.lo, 12 April 2010). In the *High Voltage Generation* lesson, the lecturer engaged the students by asking them to solve numerical problems related to high voltage generators for different voltage situations (Cst.hve.lo, 13 April 2010). However, as the lessons were highly structured and material presented constantly, apart from random opportunities, it was more a case of the lecturer directing learning than the students taking responsibility for their learning. The data collected indicated that the lecturer's role was as one who was knowledgeable and who wanted to transfer the knowledge to the students with as little fuss as possible.

Diverse needs of the learners were not given attention in the lessons that were observed. Students were generally treated the same way, with no extra or special effort made by the lecturers to cater for the diversity of student's learning needs. This was commented on in the student interview:

- *Lecturers should know the students well- their weaknesses etc so that it can help them to help the students better* (Cst.stu.int, 14 April 2010)

clearly illustrating the need for lecturers to be more tuned in to the different learning needs of students in their classes.

Demonstrates an understanding and in-depth knowledge of content and maintains an ability to convey the content to students

The three lecturers demonstrated considerable knowledge and in-depth understanding of the content of the lessons they taught. This was determined by the highly structured nature of the lessons (example of direct instruction), which focused on the lesson topic, and the manner in which they asked questions, explained, and responded to the rare questions asked by the students.

Regarding *maintaining an ability to convey the content to students,* the lecturers' expertise and confidence in the content resulted in the students listening attentively and writing notes. However, the students did not engage in lively discussions and simply accepted what was presented to them. The lecturers involved the students by questioning them and by involving them in problem-solving tasks. The lessons were based mainly on behaviourist learning principles which included obtaining the attention of students, reinforcing correct responses, and practising correct responses (Rüütmann & Kipper, 2011).

Role of Student

The role of the student is examined using the indicators identified in Chapter Two.

Accepts responsibility for their own learning

The students were observed to be largely passive learners in the three lessons; they listened to the lectures, took notes, and responded to questions. The PowerPoint presentations and board work by the lecturers contained detailed useful content for the students and the lecturers provided detailed explanations, cited examples, and demonstrated the numerical calculations of problems.

Students did not generally ask questions during the classes; the only exception to this occurred in the *Seismic Engineering* lesson when students asked questions specific to the problem assigned, when the lecturer went around to check on the progress they were making on the set task (Cst.eqe.lo, 12 April 2010). The students' dependence on the lecturer for information and for demonstration of how the calculations were to be done, was apparent from the comments in the *In-Lesson Questionnaires:*

- *Lecturer is very knowledgeable person in the field of power system;*
- *He has enough knowledge in his subject specially* [sic] *in theories* (Cst.hve.lq, 13 April 2010) for High Voltage Generation lesson; and
- *Good in planning the lesson for teaching and following it accordingly, have great professional knowledge* (Cst.iro.lq, 13 April 2010) for Linear Control Robotics lesson.

The comments demonstrated the faith and confidence the students had in the lecturers to provide them with the essential knowledge and skills which therefore made them dependent on the lecturers.

Actively participates in the class

As indicated above, student participation was low in the lessons and they were mostly passive listeners. In some instances, they participated but that was when asked by the lecturer rather than on their own initiative. Moderate levels of participation were observed in the three lessons during problem solving and when students answered questions, apart from which students mostly listened and made notes. Perhaps the listening was active as they made notes in all three lessons.

Collaborates/teams with other students

There were no opportunities for group discussion or collaboration between students. The lecturers used the lessons to communicate conceptual knowledge and skills to the students, which required the students to listen, understand and work on problems. To sum up, students were basically passively engaged in the lessons.

Summary

This section addressed the question: *How do the lecturers implement their prepared plans in a way that supports student learning?* Analysis of the data suggests that the lecturers mainly used direct instruction methods to teach, focussing specifically on content and the tasks students were required to perform. This was noted specifically in the *Seismic Engineering* and *Linear Control Robotics* lessons.

Some forms of interaction, such as asking questions, occurred but these were not well developed in the lessons. Questions were also used as part of the informal formative assessment of student learning. One of the lecturers placed the responsibility of learning on the students with whom he had developed an understanding about their attendance.

The content was undoubtedly one of the strengths in their teaching repertoire, as they were knowledgeable, and demonstrated deep understanding of their respective

subjects. This observation is corroborated by the student comments in the *In-Lesson Questionnaires* (Appendix 6.3). The lecturers' behaviour indicated that they largely saw their roles as transmitters of knowledge, and the students consequently assumed a passive role in the lessons. In summary, the lecturers used a highly scripted method of teaching to achieve the learning outcomes of the lessons. They used a positivist lens to look at teaching and learning processes, which they put into practice in a pragmatic manner.

Evaluation

The final section of the case study, evaluate the findings of the planning and implementation phases to address the question: *To what extent do the planning and implementation practices of the lecturers' support student learning?*

Analysis as done in the previous two case studies is focussed on two main issues: i) the congruence between what was planned for each lesson – as described in the planning section – and what was actually implemented in the lessons – as observed in the implementation section, and ii) the impact of these planning and implementation practices on student learning vis-à-vis the seven categories identified in the analytical framework.

Learning Outcomes

This discussion shall focus on two issues: i) congruence between the planned LOs and those that were actually implemented to support student learning, and ii) the alignment of the LOs with the teaching learning and assessment. However, it is pertinent to comment initially on the construction of the LOs as these comments provide further insights.

Construction of Learning Outcomes

One of the key findings of the LOs planned by the lecturers was that they were subject-specific, focussing on the knowledge and skills which would be required by the students in their future workplaces, together with a few personal-generic LOs which were included in just one of the lessons.

The findings on planning practices corresponded with the literature that engineering, and technology degrees tend to be highly structured programmes biased towards acquisition of knowledge (Svedberg, 2011). The engineering schools traditionally focussed on subject-specific learning outcomes on technical knowledge and ability, and paid little attention to personal generic LOs.

Inconsistent practices were identified in the development of LOs when they were compared with the SMART criteria. The LOs for the lessons demonstrated mixed practices with some failing to demonstrate an understanding of how LOs should be framed (i.e. specific, measurable, achievable relevant and time -scaled) and others reasonably well-focussed. Perhaps the mixed findings could be explained by the absence of written lesson plans. The process of writing plans would have allowed some reflection and forethought during the framing of the LOs.

Using Bloom's Revised Taxonomy as a measure of levels of thinking, greater numbers of LOs (63%) fell in the lower levels that were neither challenging nor demanding for students at tertiary level (Appendix 8.1). On the other hand, it could be argued that the lower level LOs were necessary for the lessons as they were required at that level of the programme.

The findings therefore suggest that inadequately developed LOs impacted on learning, as they provided neither directions for teaching and learning activities nor well thought out assessment practices for the lessons.

Congruency of LOs

Despite inconsistencies in the design and construction of LOs, there was congruence between what was planned and what was implemented. The lesson observations found that the lecturers kept to the plan and were conscientious about achieving the LOs (Cst.fld.nt, 11-17 April 2010). While the proposed LOs were followed precisely and implemented as planned, unplanned 'hidden' LOs of the personal generic type too guided the lessons.

In the *Linear Control Robotics* lesson the lecturer by subtly communicating his expectations of punctuality and responsibility for learning, presented a realistic

representation of learning in a tertiary college, by obliging the students to take responsibility for their own learning and behaviour.

In the *In-Lesson Questionnaire* for the lesson, students commented on this particular trait of the lecturer:

> *He came on exact time as always and left the class at exact time* [sic] (cst.iro.lq, 13 April 2010).

In the *High Voltage Generation* lesson the lecturer's pleasant demeanour and by the creation of a cheerful and positive atmosphere in the class encouraged student learning. Non-verbal cues such as nodding, leaning forward, and listening attentively to what the lecturer was explaining through the PowerPoint presentation provided evidence of the impact of the lecturer's behaviour on the students' learning (Cst.hve.lo, 13 April 2010). On the other hand, the example of a lecturer being engrossed in the lesson, which occurred in the third class, was neither desirable nor supportive of student learning. The lecturer's unintentional ignorance of student sleeping in her class and some getting distracted could send the wrong message about acceptable behaviours in the college classroom (Cst.eqe.lo, 12 April 2010) and the importance of what they might be learning.

The unplanned LOs for two of the lessons enhanced the quality of the learning environment indicating characteristics of student-centredness. On the other hand, the failure of one lecturer to be vigilant in creating an environment conducive to learning, reduced student learning opportunities. The unplanned LOs that were observed in the *Linear Control Robotics* and *High Voltage Generation* lessons had potential long-term benefits. They helped in instilling awareness and good practice in promoting student learning.

Alignment of LOs

Analysis of the findings in the planning, implementation and evaluation phases were found to be only partly aligned. This was because effective teaching and learning approaches were not selected to attain the outcomes and the assessment too was not organised effectively to assess student learning. For instance, although the LOs in the

Seismic Engineering lesson were active ones requiring students to *interpret* and *analyse* seismic force on building structures, the use of 'conventional lecture' for the major portion of the lessons did not provide opportunities for students to be *actively* engaged with learning. As observed, *all* the students did not partake in the learning process, as some could not hear the lecturer from the back of the classroom (see *In Lesson Questionnaire comments* Appendix 6. 3.1 for information). Closer examination made it apparent that although demonstration and practice time was included in the lesson, it was more focussed on the lecturer explaining and demonstrating the analysis of seismic forces on building structures than the problem-solving task that followed. These findings clearly did not show alignment of the learning outcomes with the teaching-learning and assessment strategies.

The situation in the *Linear Control Robotics* lesson differed, in that the LOs were more closely aligned with the teaching and learning approach, which was 'lecturing', but included questions which required that students explain the *what, how* and *why* of the procedures in the calculations. The purpose of the questions was two-fold; they were used as part of the teaching strategy and to assess student learning in an informal formative manner. Thus alignment of the LOs with the teaching and learning approaches and assessment in the lesson was established. The same effect was seen in the *High Voltage Generation* lesson, where the LOs were to some extent aligned with the lecture-cum-questioning strategy.

Evaluation of the LOs, both intended and unplanned, indicated that although the LOs were neither completely congruent nor satisfactorily aligned to promote student learning, a beginning had been made by the lecturers (that the LOs were written in the form of students' expectations) who were engineers or other professionals, but not trained teachers. This circumstance may also explain the focus was on subject specific LOs. The impact of the LOs on student learning was, in effect, on the acquisition of subject-specific knowledge, on a few important values such as punctuality and taking responsibility for learning and on the creation of an environment conducive to learning.

However, none of the three lessons represented the best examples of alignment as the students should have constructed meaning from what they did in the lesson and

the lecturer should have aligned the learning activities with the learning outcomes. The lessons were highly structured (based on direct instruction method) and provided no flexibility for discovery learning or problem-solving by students. Moreover the use of lecture was not flexible enough to align the learning activities with the learning outcomes in the lessons. The key to the alignment is that the components in the teaching system, especially the teaching methods used and the assessment tasks, be aligned to the learning activities assumed in the learning outcomes (Biggs, 1999) which was not the case here.

In summary, the lessons were not well aligned with the LOs, suggesting that not much deep learning actually occurred. This could be an outcome of inadequately developed LOs. When LOs are not specific and measurable, it becomes difficult to achieve them in the lessons as there are no clear-cut directions about which teaching and learning approaches and assessment strategies would be most suitable and relevant for their attainment. Moreover the strong content-focus and the tightly structured direct instruction mode greatly influenced how the lessons were organised, with transmission of knowledge from the lecturers to the students being the main approach. A key factor that may explain the lack of active engagement with students may be that the college offers engineering degrees, and most of the lecturers were not trained teachers, but subject specialists, who saw their primary role as deliverers of content. A major criticism about the use of direct instruction is that if used in a narrow sense can regress into lecture-style of teaching (Cavanagh, 2004, p. 4) as appeared to occur here.

Teaching and Learning Approaches

In this section, the congruence of teaching and learning approaches between the planning and implementation phases shall be evaluated to ascertain to what extent student learning was supported in the lessons.

As communicated by the lecturers in the pre-conference interviews, 'lecture' (based on direct instruction) was the main teaching and learning approach planned in the three lessons.

In the implementation phase however, besides the lecture, other strategies such

as questions, demonstrations and problem-solving activities were used to engage students. While the latter approaches were included at times, they merely supported the use of 'lectures', which were predominant in the three classrooms of this College. The conventional 'lecture' is rooted deeply in the background of teaching engineering courses. According to Burden and Byrd (2010) teachers at engineering universities see themselves as engineers, researchers, or scientists rather than as teachers. This, they suggest, leads to a conflict between different epistemologies: hard sciences such as engineering as opposed to soft sciences such as pedagogy. Therefore although these deficiencies in engineering education have been exhaustively described in recent years, the traditional approach prevails at CST.

Felder, Woods, Stice, and Rugarcia (2000) report that although the content has changed in some ways, and students use calculators and computers instead of slide rules, many engineering classes are taught in the same way that engineering classes were taught in 1959. The introduction of better teaching methods in recent years (Felder et al., 2000) does not appear to have brought change to the classrooms of engineering students. Similar conclusions may be drawn about the lecturers at CST who used 'lectures' and were comfortable with that style. The directness and content-specific focus of the teaching, and the tight link between the teachers' examples and the tasks required of students did not enable students to take responsibility for their learning. Students were guided and supervised very closely by the lecturers, a circumstance most clearly demonstrated by the problem-solving activity in the *Seismic Engineering* lesson.

The questions and demonstrations conducted in the three lessons were also closely linked to the examples demonstrated by the lecturers. This approach is strongly modelled on direct instruction, which is a straightforward way of addressing the lesson's learning outcomes (Burden & Byrd, 2010; Kroesbergen & Van Luit, 2003). In such a setting where the students were guided, provided with examples and directed in their learning, opportunities were not provided for students to construct knowledge on their own, or pursue deep learning of the content. 'Lectures' supported by problem-solving sessions, demonstrations, and questions were straitjacketed and characteristically teacher-centred. However, the function of higher education in

engineering degrees is not only to impart knowledge but also to foster talents for future use (Liu, 2004). Moreover, the development of science and technology requires that students have interdisciplinary knowledge and a broad perspective on their own discipline; so diversified teaching strategies are required in order to help students to develop a comprehensive range of qualities such as problem-solving skills, critical thinking skills, communication skills, cooperation skills, and independence (Liu, 2004).

Although there were not many students' comments in the *In-Lesson Questionnaires*, a few were significant in the context of this discussion. For example:

- *He conducted a well organised lecture all the time*;
- *I took five courses* [modules] *from this lecturer and the way of delivering is same* (Cst.hve.lq, 13 April 2010)

which implies that the conventional 'lecture' was used in all of the lessons on *High Voltage Generation*. The comment:

- *It was* [a] *well organised and planned lecture as usual* (Cst.eqe.lq, 12 April 2010)

about the *Seismic Engineering* lesson has the same implication.

Comments by the students reinforced the findings of the research observations that 'lecture' was the most commonly-used strategy used in the lessons. They also confirmed that the lessons observed by the researcher were typical of those provided by the lecturers. In relation to the *Linear Control Robotics* lesson students commented:

- *The way of teaching and management of class are same every time* (Cst.iro.lq, 13 April 2010).

Similar comments indicating that the lessons were typical were made with regard to the other two lessons. The majority (85%) of students agreed that the lesson *Linear Control Robotics* was typical (Cst, iro.lq, 13 April 2010), while 88% of students in the *High Voltage Generation* lesson (Cst.hve.lq, 13 April 2010) and 85% of students in the *Seismic engineering* lesson (Cst.eqe.lq, 12 April 2010) confirmed that the classes were representative of those lecturers' classes. Feedback in the students' interviews also corroborated the idea that lectures were *always* and *mostly* used in the classrooms (Cst.stu.int. 14 April 2010).

Interviews with students revealed that other learning experiences were included in the course of their study than what was observed. In this regard, they said:

- *Field visits are carried out to factories, industries and visiting a Hydro Project in India;* and
- *On the Job Training are done for 1½ months or 42 days, which is very useful for example I worked in Phuentsholing City Corporation and supervised the work of assessing streetlights in the town. It was a great learning experience as I and my friend were given a lot of responsibilities* [sic] (Cst.stu.int, 14 April 2010).

Such activities provided opportunities for students to experience different learning situations and to acquire more knowledge and skills. This may well have been a demonstration of lecturers' teaching skills and strategies that has not been captured by the current research which is based on evaluation of the specific lessons included in the project. Perhaps there were these practical applications of the theories, and what was observed was the theory lesson based on lecture.

In summary, there was considerable congruency between the teaching and learning approaches that were planned for and which were actually implemented in the lessons. Analysis of the lessons that were observed for this study suggests that besides 'lecturing', other strategies to engage students were employed in the classrooms of these lecturers.

Content Knowledge

In this section the congruency between content planned and actually implemented is examined to ascertain to what extent they enhanced student learning. As explained for the previous case studies regarding the acknowledgment of the content expertise of the lecturers in each college, the observations were based on what was observed and understood and that was what was planned, was implemented in the lessons.

Lecturers appeared to take into account the importance of lesson content and to ensure that what they had intended to teach during the lesson was actually delivered. Knowledge of the subject content was one of the strengths that appeared in the

repertoire of lecturers' skills was their knowledge of the content of the lessons, demonstrated in the LOs that were mostly subject-specific (Table 6.1). The lecturers had years of experience and were qualified with doctoral and masters degrees in their respective subject disciplines (Royal University of Bhutan, 2011b).

The three lessons covered adequate depth and breadth of content, which was indicated by the fairly well-paced one-hour lessons. Each lesson consisted of information related to the content area, demonstration of calculations and practice by students. For example, the time spent explaining the complexity of the calculations procedures using both the manual and software in the *Seismic Engineering* lesson, was approximately 40 minutes, and a major portion of the lesson's time. The remaining time was spent on practising calculations similar to the ones demonstrated by the lecturer (Cst.eqe.lo, 12 April 2010). Similar patterns were observed in the *Linear Control Robotics* and *High Voltage Generation* lessons in which the amount and nature of content covered were suitable for the one-hour lesson. However, feedback from the students' interviews suggest otherwise. Their comments included:

- *Give more content;* and
- *Present effective lectures with more content/examples* (Cst.stu.int, 14 April 2010).

Students wanting more content tells us a lot of their attitude to their studies. Engineering is the application of scientific and mathematical principles to practical ends such as the design, manufacture, and operation of efficient and economical structures, machines, processes, and systems (Engineering, n.d as cited in Hynes, 2007, p. 7). The module plans included these topics, focussed on the engineering design process, the steps, and how the students should systematically approach problems to create design solutions. Each of the three lessons included problem-solving and mathematical calculations. However, engineering sciences are complex, the students evidently thought that the content provided in the lessons was not adequate and requested more. Additionally, the summative examination system could also be a likely reason for more content.

In engineering science, failure to apply Pedagogical Content Knowledge (PCK)

was evident in the manner in which the lessons were lecture-dominated, and in the use of questioning, demonstrations and problem-solving activities, which were not very skilfully adapted for the lessons. In summary, although the content of the engineering subjects was well developed and taught, the lack of pedagogical content knowledge prevented the use of other effective active learning approaches.

Assessment

This section examines congruence between the assessment that was planned and that which was actually implemented in the lessons, and evaluates to what extent the assessment supported student learning. As noted earlier the most common strategy used by the lecturers in the three lessons was informal assessment through questioning, although it was not explicit in the planning phase.

In the observed lessons, questions were asked to check students' understanding, and provide opportunities to clarify matters when necessary. In the *High Voltage Generation* lesson questioning was used to assess student learning informally. The lecturer used the questions at regular intervals throughout the class in order to review information learnt previously or that being presented. Most of the questions could be categorised as 'recall' or 'comprehension' in nature. In the *Linear Control Robotics* lesson, questions prompted students to do more than simply recall information. The questions were designed to provoke thinking, and to have students contribute to an explanation of the content, and thereby take some responsibility for their learning. In the *Seismic Engineering* lesson, the lecturer used monitoring during the problem-solving activity as informal formative assessment, but the students did not benefit adequately from this strategy because the activity was not structured well. Assessment of prior learning was not attended to effectively either.

In summary, although informal formative assessment was not included in the plans, it did take place during the lessons. Assessment was not, therefore, satisfactorily prepared and students did not receive the benefits that they may have if it had been better planned and implemented.

Resources

In this section the congruence between resources that were planned for and the resources that were actually implemented, and their impact on student learning are examined.

During the pre-conference interviews, the lecturers who taught the *Seismic Engineering* and *High Voltage Generation* lessons mentioned the use of PowerPoint presentations in the lessons. In the *Seismic Engineering* lesson, the lecturer also planned to use Manuals and the software CAD for the analysis and interpretation of seismic forces, as lesson resources. On the other hand, the lecturer responsible for the *Linear Control Robotics* lesson did not report plans to use any resources in the lesson.

In the implementation phase of the lessons well-developed PowerPoint presentations in the *High Voltage Generation* lesson with diagrams and pictures enhanced the lecture. The flexibility that using the LCD projector and white board as well as the manuals and CAD software in the *Seismic Engineering* lesson allowed was evidence of good practice as they augmented the organisation of the lesson. They also brought some variety to the students' learning experience (Cst.eqe.lo, 12 April 2010). The lecturer teaching *Linear Control Robotics* used the whiteboard effectively while teaching, writing and solving problems systemically and legibly, which the students copied word for word into their notebooks (Cst.iro.lo, 13 April 2010). However, since the LCD projectors and computers were not fitted into the classrooms, lecturers had to bring and set them up before the lesson, which they did for the *Seismic Engineering* and *High Voltage Generation* lessons. This reduced some lesson time and as the lessons were taught using 'lectures', a variety of resources were not necessarily required. It was the lecturers themselves whose knowledge constituted a valuable resource.

Unlike lecturers in the previous two Colleges (CNR and Sherubtse), lecturers in CST did not raise the shortage of resources as an issue. The College Library is fairly well stocked with a collection of 13,000 books, most of which are multiple copies of textbooks for the programmes e.g. as many as 120 copies of the same textbook for Year 2 Civil Engineering (Cst.lib.int, April 2010). So while the collection appears substantial,

it is, in effect, quite limited.

In summary, resources were used quite differently across the three lessons. The *Seismic Engineering* lesson had the 'richest' use of resources with the software CAD, Codebooks IS -13920 and IS-1893 and PowerPoint presentation. Considering that 'lecture' was the main teaching approach used in the lessons, a large number and variety of resources may not have been necessary to support student learning.

Role of the Teacher

The role of the teacher in the planning and implementation phases is now evaluated to ascertain to what extent they supported student learning. In the planning phase the lecturers played roles as curriculum and module planners, and as resource organisers. This entailed planning, deciding the content of the lessons, developing and arranging accessibility of resources and therefore showed teacher-centred characteristics.

In the implementation phase, lecturers were essentially the information providers, facilitators to a small degree and as assessors of student learning. The roles accorded well with the planning role, as the lecturers implemented what was planned for the lessons. Lecturers assumed role as information transmitters, as subject content experts. Observation of the lessons indicates that the lecturers essentially maintained teacher-centred strategies as they provided content, demonstrated examples of mathematical calculations, and closely guided students' practice of the examples, making tight link between what was taught and what was learned: their role was as transmitters of knowledge. This aspect was recognised by the students and commented on at interview. They expressed their dissatisfaction with the way some lecturers taught and asserted that they did not want to be spoon-fed. For example:

- *Some lecturers make us memorise; I sometimes think we are spoon-fed as we are made to memorise things especially in theory class especially subjects with mathematical calculations. (Cst.stu.int, 14 April 2010).*

Perhaps it was ironic that the idea of spoon-feeding was also referred to by lecturing staff:

- *I also feel that we can't do spoon-feeding at the tertiary level. Students have to become independent learners;* and
- *Give difficult/challenging problems to students in order to check the learners' abilities and help the ones who do not perform well* (Cst.aca.int, 14 April 2010).

These lecturers demonstrated their awareness that learning needed to be made more challenging for the students, that they should take responsibility for their learning and that the diverse learning needs of the students needed addressing. Therefore there seemed to be some consensus on how lecturers should teach and students learn. Neither lecturer nor students viewed 'spoon-feeding' very positively, and each wanted to break the cycle of teacher-centred teaching and learning. Yet spoon-feeding was evident and sometimes demanded.

In addition to the problem of spoon-feeding, other issues were articulated by the students:

- *Some lecturers come with a set lesson and does not allow us to ask questions as it will disrupt his class*; and
- *Asking some/certain teachers questions may disrupt them* (Cst.stu.int, 14 April 2010).

These comments described teacher-centredness of the lecturer's approach to teaching. However not all the lecturers did this:

- *In 2nd Yr it's not like this, in fact the teachers always encourage us to ask questions* (Cst.stu.int, 14 April 2010).

The students also commented that lecturers should cater to the diverse learning needs of students as mentioned in the teaching and learning approaches category of the Implementation phase (page 237).

However, in the interviews, the lecturers asserted that they used a variety of teaching and learning approaches:

- *Basically most of the time I do PowerPoint presentations, then give numerical problems to students (individual task), assignments, organise tutorials in small groups (20 max) – on whatever concept not understood in the lecture they clarify, discuss and explain. The interaction is more in tutorials than in lectures as the students are able to further discuss the topics in greater detail, which they have not*

understood in the lecture. The students find tutorials helpful;

- *For numerical problems, I first demonstrate some examples and then assign students individual problems to solve;* and
- *During the PowerPoint presentation, that is the lecture, we have interaction through Q & A where students are receptive and responsive. 3rd Yr students are more open and interactive, ask questions as well as answer them when asked. The 1st Yr students are hesitant and I feel that though they know the answer, they do not respond or even ask questions when in doubt* (Cst.aca.int, 14 April 2010).

The lecturers appeared aware of the theory but were unable to put it into practice to the satisfaction of students.

Lecturers related the variety of teaching strategies they used, and observed that the students were reticent in class in the first year but by third year they become more open and interactive. The lecturers also described the difficulties they encountered while teaching. For example:

- *Large student numbers/congestion … 128 students in 1st Yr and 94 in 3rd Yr. Therefore evaluation becomes very heavy;*
- *Poor learning environment with no equipment/apparatus/resources;* and
- *Lack of library references* (Cst.aca.int, 14 April 2010).

Equally in their interviews, students talked of the roles of lecturers describing them more as *facilitators than as transmitters of information.* Students had the following descriptions of the activities of lecturers:

- *Encourage me to learn independently;*
- *Encourage me to learn with other students;*
- *Give me work that makes me think;* and
- *Support me and help me* (Cst.stu.int, 14 April 2010).

This suggests that students would like to see the lecturers as facilitators of their learning in a number of ways, which is no doubt accurate as the lessons observed for this study,

represent just one facet of the teaching and learning experience of the students. Further comments from the students' interviews confirm these broader experiences:

- *In 1st and 2nd Yr tutorials are useful as the students are in smaller groups. Doubts can be cleared;*
- *3rd Yr we do mini project and in Final Yr we do the Senior Project, which is very interesting as it, generates ideas and develop models. In the Robotics group simulations are done though not the real model. It makes us independent learners;*
- *The Senior Project is an open kind of research. Example for the 3rd Yr Mini Project I have worked on a hydro alarm which helps in tracking water shortage problems, cuts water shortage;* and
- *Mostly the kind of learning depends on the subject* (Cst.stu.int, 14 April 2010).

This last comment is an indication that students understood that teaching and learning approaches were dependent on the nature of the subjects and that lecturers used different approaches to teach.

The lecturers were quite positive in their encouragement of active and deep learning, conditional upon the problems/issues being addressed:

- *We need to have adequate facilities like reference books, well equipped laboratories, adequate number of lecturers, good size student number – not too large as we cannot give individual attention with large numbers. At the present our main aim is to cover the syllabus* (Cst.aca.int, 14 April 2010).

The closing sentence is revealing, in that, 'covering the syllabus' is congruent with an examination-centred programme and therefore teacher-centred. Additional explanation, for the overwhelming use of 'lecturing', or simple transmission of information to students: lack of resources. Both the examination system and paucity of resources besides a range of other factors clearly influenced teaching and learning approaches. These other factors may include customs and practices in the College. Although resources are important, there are other important elements, such as motivation, which impact on student learning. According to Biggs (1999) motivation is the product of good teaching and not its prerequisite (p.61) Shuell (1986 as cited in

Biggs, 1999, p. 23), asserts that if students are to learn in a reasonably effective manner, then the teacher's fundamental task is to have students engage in learning activities that are likely to result in their achieving intended learning outcomes. Had the lecturers included activities to engage students in their learning, it would definitely have enhanced the learning experiences of the students in the lessons.

In conclusion, the role of the teachers in these lessons was as transmitters of information/content. However, other facets of their role in teaching and learning emerged through interviews with students and staff. The data that emerged indicates that there were effective and not-so-effective practices employed by lecturers. As reiterated earlier teachers at engineering universities are inclined to see themselves as engineers, researchers or scientists rather than as teachers (Svedberg, 2011). He asserts that research into teaching in higher education belongs to the epistemology of constructivism, in which knowledge is regarded as something being constructed by students in their learning context. This was not occurring in the College of Science and Technology: instead lecturers adhered to a view of knowledge as being something objective and absolute, and therefore independent of the teacher, the students, or the learning context. The 'teacher' was viewed as someone who was competent and able to be trusted to present and explain the necessary information in front of and to the class. Svedberg (2011, p. 3) explains that it is then up to the students to absorb what are presented so that they can reproduce it correctly. He argues that as long as the engineering faculty is 'trapped' in realism without an awareness of the epistemological differences between engineering science and engineering education, it is questionable whether classical culture in engineering can be reformed.

Role of Student

The role of the students that emerged from the data is a clearly passive one. In the Implementation phase the students mostly listened (some attentively, others passively), made notes (most of them), responded to questions, and practised mathematical calculations as directed by the lecturers. Apart from what was demanded of them by the lecturers, students were rather reticent and self-effacing.

There are several factors in play here, which could provide plausible explanations for their behaviour. The cultural factor related to *tha damtshig* and *collectivism, power distance* (explained in the Literature Chapter) conferring a high degree of respect to teachers and the teacher-centredness experienced by the students in the schools are largely responsible for their attitude towards learning. Years of this tradition lead to fostering passivity in the students and a desire for more content. This trait also became apparent in the staff interview, in which attention was drawn to the passivity of students in Year 1 (*were mostly quiet and did not ask questions*) and the gradual change as they moved to Year 2 (*became more open and interactive in the class*, Cst.acu.int, 14 April 2010). By the time they enrolled in the tertiary colleges, some students were likely to appreciate the learner-centredness and willingly take greater roles to interact in the lessons. Evidence of such attitudes was found in the *In-Lesson Questionnaire*. The students' background learning experiences and their respect for the lecturers' authority, and belief in their capacity to teach shaped the learning attitudes. Observations of the lessons revealed that they listened attentively and took copious notes during the classes.

The preceding case study provided evidence of the importance of listening and how it facilitates effective notetaking, itself a challenging task. Based on students' feedback on the *In-Lesson Questionnaire* and in the interviews, it emerged that students found the courses quite challenging. The subjects were relatively new to them, and they were motivated to listen and learn. Students' dependence on the lecturers was also advanced by the inadequacy of learning resources (reference books and laboratories), making them rely on the lecturers for topic content.

Data from the lesson observations showed that the students spent approximately 80 - 85 % of the time listening, and taking notes, which was not altogether intellectually demanding on them. The remaining 15 - 20% was spent on responding to the questions asked by the lecturers. A parallel can be drawn for the lecturers' role too, in which 80-85% of the time was spent explaining, demonstrating, asking questions of the students and 15-20% listening to the students' answers. In summary, the students were mostly passive in the lessons.

Summary

Evaluation of the data in this section has helped to answer the research question – *To what extent do the planning and implementation practices of the lecturers support student learning*? The findings indicate that student learning was only moderately supported, and that support came mainly from the use of direct instruction strategies that included taking students systematically through learning steps. Two lessons were considerably focussed, with the LOs planned and implemented without deviation. An exception to this was the unplanned LOs on punctuality and responsibility for learning in the *Linear Control Robotics* lesson, which occupied a significant portion of the lesson. Even the problem-solving time provided to students was carried on in a controlled period of time, thus keeping the students focussed on the task. The teaching and learning approaches were largely teacher-centred and although on the surface it may have appeared that the learning lacked depth, in their interviews, students were positive about their learning experiences. They stated that they were satisfied with the teaching and learning approaches (Cst.stu.int, 14 April 2010). Their learning experiences were nevertheless limited. Other practical opportunities provided as part of the undergraduate Engineering degree, such as third and fourth year project works were viewed positively by students. One of those interviewed shared his success with a project, which included his devising a hydro alarm that helped in tracking water shortage problems (as the College faced a water shortage problem).

The use of informal formative assessment during the lessons was only slightly beneficial. The way in which the assessment was conducted was not conducive to student learning; the questions merely helped lecturers to check whether the students had understood the lesson. Assessment was not carried out purposefully. Students seldom asked questions and then never pro-actively. Unless they were obliged to do so, they simply listened. The lessons were highly structured and followed through meticulously, with not a moment unspoken for.

Conclusion

In this chapter, planning, implementation and evaluation practices in the College of Science and Technology have been explored using data collected in a number of

ways. Evaluation of the data has resulted in attention being drawn to key findings regarding the teaching strategies practiced in the College. Data from the *lesson observation records, In-Lesson Questionnaires, staff* and *student interviews and field notes* indicates that the transmission, or teacher-centred approach to teaching prevailed and that some moderate levels of active learning was happening in the classrooms.

In the next chapter the concluding case study on the Paro College of Education will be discussed.

Chapter Seven: Paro College of Education

Introduction

Situated in the lush broad valley of Paro at 2,250m above sea level, the Paro College of Education, formerly known as the National Institute of Education, was established with fifteen trainees and a demonstration school at the Rinpung Campus as a pre-school training centre in July 1975. It is close to the country's international airport and is about an hour's drive from Thimphu.

The College has a close association with the Ministry of Education, and works closely with the other College of Education in Samtse to train teachers. The College also participates in the development and improvement of education throughout the country. The College was originally established as a teacher-training centre for primary school teachers. In July 2000, the royal government approved the change of its nomenclature to the National Institute of Education because of its added responsibility for school curriculum and the addition of a research centre (Paro College of Education, 2011a). In 2003, it became a member of the Royal University of Bhutan (RUB) and was renamed Paro College of Education in 2006. The college aspires to be a centre of excellence for teacher education, specialising in primary education, early childhood education, teaching of Dzongkha, educational management and leadership thus providing a true foundation in education for Gross National Happiness (Paro College of Education, 2011b). The college aims to:

- *Prepare professionally competent, ethically sound, and progressive teachers;*
- *Offer teacher education programmes that are responsive to the needs and aspirations of Bhutanese children and society at large;*
- *Be the primary centre for Bhutanese educational research and consultancy;*
- *Encourage and facilitate professional growth of the staff engaged in teacher education; and*
- *Create an organization that enhances teaching and learning* (Paro College of Education, 2011b).

The College offers six programmes to novice and experienced teachers. They are M.Ed in School Management & Leadership, B. Ed Primary Education, B. Ed

Secondary Education, B. Ed Dzongkha, PGDE in Dzongkha and Diploma in Leadership & Management. The two B.Ed programmes – Secondary and Primary Education are pre-service programmes and the rest are in-service programmes that allow teachers to upgrade and update their qualifications, knowledge and skills.

The total student population across the six programmes in 2010 was 786 students. The students enrolled in the pre-service programmes are successful Class XII students from both the Science and Arts subject streams, who aspire to become teachers. The admission entry requirements for the B.Ed Primary programme include success in Class XII with 50% in English and Dzongkha, and for B.Ed Secondary programme is Class XII pass with 50 % in IT and English and 40% in Dzongkha (RUB, 2011). Entry into the in-service programmes is based on academic history, experience and skills.

A total of 65 Bhutanese academics teach in these programmes. Figure 7.1 shows the staff profile by qualification. 52 hold Masters degrees in Science, Arts or Education, 12 hold Bachelor degrees in Science, Arts or Education one the Music Instructor for Music in the College has a diploma. Although the College staff profile does not show any PhD holders, four of the faculty members are enrolled in PhD degrees in international universities such as the University of New England (Australia), University of Newcastle (Australia) and University of Hyderabad (India).

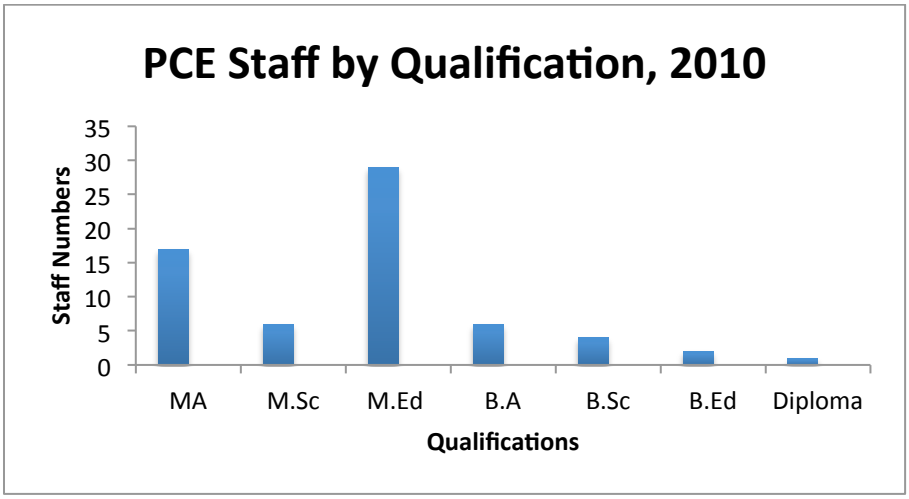

Figure 7.1. – Paro College of Education Staff by Qualification, 2010 (RUB, 2011)

Figure 7.2. shows the subject expertise across the eight subject departments in the College. The numbers of lecturers are fairly well distributed across the departments although the Social Studies, Information Technology and Health and Physical departments have smaller number of lecturers. The Figure also shows a large number of lecturers in the English department (N=14). The number of Science lecturers, too, is relatively high, as the College does not offer Science electives such as Physics, Biology and Chemistry, but concentrates on Primary Science curriculum.

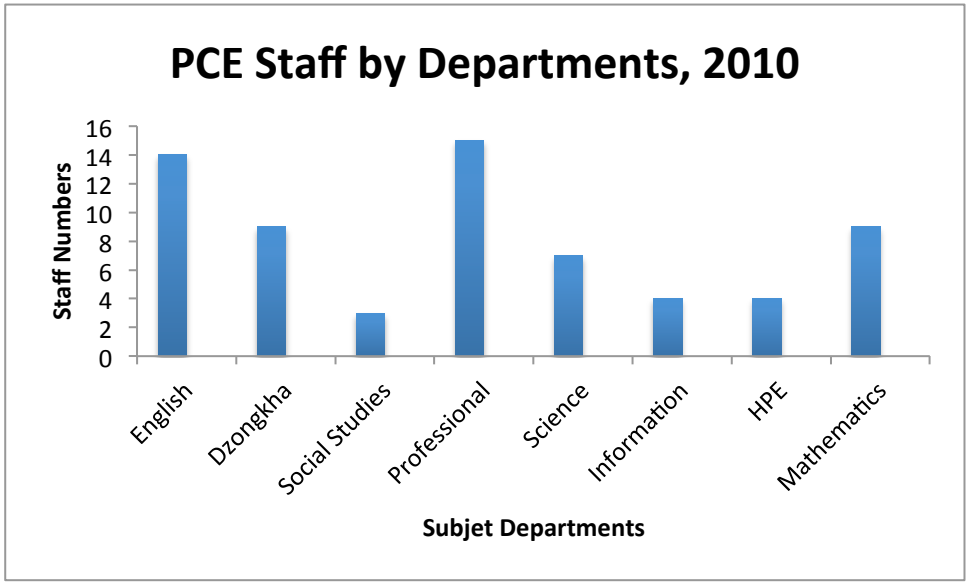

Figure 7.2. – Paro College of Education Staff by Departments, 2010 (RUB, 2011)

Although Paro College of Education was established seven years later than the Samtse College of Education, it has made rapid progress. The College has successfully introduced the Masters and Dzongkha programmes for in-service tecahers. The College also has a budding research culture and plays an active role in promoting research in teacher education. The Centre for Educational Research and Development (CERD) an integral part of the College was established in 2001 in order to address the need for an on-going review of processes, policies and programmes within the Ministry. CERD coordinates research activities for the colleges of education, facilitates research links with the Ministry of Education and other stake holders, publishes research and scholarly papers, and provides consultancy and professional community support services within the Royal University of Bhutan and Ministry of Education (Centre for Educational

Research and Development, 2010).

Additionally the old College campus was upgraded through a joint project between the Royal Government of Bhutan in partnership with the Swiss Development Cooperation and the Swiss Association for International Cooperation Helvetas. Extensive building and renovating has provided a much-needed makeover, enhancing the image of a modern supportive learning environment while retaining a Bhutanese traditional style of architecture (Christen, 2010). The development for the College led to significant increases in enrolment and contributed to an environment advantageous for teacher education.

Similar to the other case studies in this project, this one examines the nature of teaching and learning practices in the college, using the analytical framework set out in Chapter Two. The data is organised using the framework similar to that used in the previous case studies on Planning, Implementation and Evaluation.

Planning

Because Paro is a college of education whose teaching focus is on educational practices, it is intuitive that robust teaching practices should be particularly strong in comparison with those found in Colleges whose focus lies elsewhere. This is particularly important as elements of good teaching practice are not only the means by which the students are taught but also the content of their instruction. Lecturer's plans should, therefore, demonstrate features of the expert teacher's repertoire of pedagogical content knowledge. As educators of teachers, the lecturers need to model good practices - and planning is both good practice and a sign of professionalism.

Therefore, it did not come as a surprise when the three lecturers selected for data collection in the College, made available to the researcher both module and lesson plans. This was a noticeable point of departure as Paro is the only College studied in the principal study; in which had both module and lesson plans were produced.

In this section, data from the lesson plans is explored, in order to identify planning practices in the College, thus addressing the research question: *What is the nature of lecturers planning that lecturers engage in as they prepare for their lessons?*

Analysis is performed using the analytical framework employed for the preceding case studies.

Learning Outcomes

The SMART criteria (described in Chapter Two) guides exploration of the LOs written by lecturers as part of their lesson plans.

Specificity

The LOs provided in the written lesson plans are examined for specificity on types of LOs, 'subject-specific' and 'personal-generic', as well as 'levels of thinking' from Bloom's Taxonomy (1956, revised by Anderson & Krathwohl, 2001).

In Table 7.1, eight out of the nine LOs were subject-specific, developed to provide students with knowledge and skills required to guide their students to develop similar knowledge and skills in their school teaching. There was, however, an example of a personal-generic LO in the *Action of Heat on Nitrates* lesson, aimed at training the students with laboratory skills. Similar patterns like these were also seen in the module plans (Appendix 7.2) suggesting that such practices of framing LOs were prevalent in the college. It is also encouraging to note that all nine LOs used specific action verbs that focused on what students will be able to do as a result of the learning, therefore satisfying the specificity criteria.

Table 7.1.Types and Levels of thinking in the Learning Outcomes across the lessons

	Lesson	**Examples of Learning Outcomes**	**Type**	**Level of thinking in the revised Bloom's taxonomy**
1.	*Action of Heat on Nitrates* (Pce.epm.lp, 25 May 2010)	*Investigate the action of heat on nitrates*	Subject-specific	Analysing
		Identify nitrates	Subject-specific	Remembering
		Develop practical skills - safety, observation and data tabulation	Personal-generic	Creating

	Lesson	Examples of Learning Outcomes	Type	Level of thinking in the revised Bloom's taxonomy
2.	*A Happy School* (Pce.sorg.lp, 26 May 2010)	*Identify the elements/characteristics of a Happy School*	Subject-specific	Remembering
		Define a Happy School	Subject-specific	Remembering
3.	*Coordinate Geometry* (Pce.tma.lp, 26 May 2010)	*Tell the coordinate of the points marked in the grids*	Subject-specific	Remembering
		Draw shapes as per the given coordinates	Subject-specific	Remembering
		Play and write instructions for games on coordinates	Subject-specific	Creating and Remembering
		Work out questions on coordinates	Subject-specific	Applying

With reference to the Bloom's Revised Taxonomy, a combination of lower and higher order thinking was incorporated into the LOs (Table 7.1). Approximately 56 % belonged to the lower levels of thinking, mostly clustered around '*remembering*'. In contrast, 44% were in the higher levels of thinking category, falling into the *Applying*, *Creating* and *Analysing* categories (Table 8.3 in Appendix 8.1). While learning outcomes can be pitched at various levels of thinking, as appropriate in tertiary study, more demanding levels of thinking that require students to demonstrate application, analysis, evaluation and creation were conspicuously absent. The lower levels of thinking that were built into the LOs may not be challenging enough for students. This is especially so, in the case of the *Happy School* lesson, in which the LOs fall into the '*remembering*' category.

LOs designed for lessons in education need to have a dual purpose, namely to guide teaching and to model ways in which LOs can be implemented by the students who will be teaching in primary schools. This may help to explain why such a large percentage of the LOs were written at lower levels. The design of the LOs was determined by the level and intent of the module, as was demonstrated in the *Coordinate Geometry* lesson. These LOs were framed suitably for teaching the primary

education students who were preparing to become primary teachers so that, in turn, they can pass them to students in the upper primary classes, making them relevant to the level and intention of the lesson.

In summary, the LOs for the lesson plans were specific, stating precisely what students would to during the lesson. However the LOs written for the *Action of Heat on Nitrates* lesson plan were far superior to those in the other two lessons because they included a combination of lower and higher levels of thinking, resulting in a challenging lesson for the students.

Measurability

The LOs for the three lesson plans were measurable as students would be able to demonstrate different learning experiences as a result of the lessons.

Examples of measurable LOs in the *Coordinate Geometry* lesson plan *Tell the coordinates of the points marked in the grids, Play and write instructions for the games on Coordinates* (Pce.tma.lp, 26 May 2010) were clear and observable. Similarly the LOs in the *Action of Heat on Nitrates* lesson plan, *Investigate the action of heat on Nitrates*, *Identify nitrates* and *Develop practical skills – safety, observation and data tabulation* met the measurability criteria (Pce.epm.lp, 25 May 2010). Similar patterns were seen in the LOs for the *A Happy School* lesson plan.

However, although the LOs in the three lesson plans had behaviours very clearly stated, whereas the conditions and criteria were absent. It is important to write LOs using the criteria and conditions as are the direct measures of learning and a means of determining if intended learning has actually occurred.

Achievability

The LOs in the three lesson plans were written clearly and within the range of capacity of the students. The LOs explicitly stated what they wanted students to do; for example, in the *Action of Heat on Nitrates* lesson plan, the LOs required the students to *investigate*, *define* and *develop* (Pce.epm.lp, 25 May 2010). Similarly LOs for the *Coordinate Geometry* lesson plan required that students *tell*, *draw, play, write* and *work out* (Pce.tma.lp, 26 May 2010) in order to demonstrate their learning. There was no

ambiguity in the action verbs, which described in the lesson plans what it was that the students were to do. The same pertained to the LOs for the *A Happy School* lesson. The LOs were also within the capacity of the students with the focus being clear and realisable by the students. The LOs for the B.Ed teacher-training programme described what the students needed to know.

Relevance

The LOs for the three lesson plans were relevant and consistent with the requirements of the B.Ed teacher training programmes. For example, the LOs in *Coordinate Geometry* lesson were essential for the B.Ed Primary student teachers to learn, as they would have to be able to teach Coordinate Geometry in the upper primary classes in the schools. Similarly, the LOs for the *Action of Heat on Nitrates* lesson enabled student teachers to learn how to conduct similar experiments in Chemistry classes in high schools.

Thus, the LOs served a dual purpose for the students as explained earlier, first to learn themselves and second to teach the same material in schools. Similarly, in the *A Happy School* lesson plan, the LOs were also relevant, as they required that students become familiar with characteristics of a happy school, and that they be able to convey comparable characteristics to children in the schools where they will teach after graduation. Consequently the LOs for the three lesson plans were both relevant, and applicable to the student teachers' training context.

Time Scaled

The lessons were planned for a one-hour duration, during which it was observed that the three LOs in the *Action of Heat on Nitrates*, two LOs in *A Happy School* and five LOs in *Coordinate Geometry* lesson plans were feasible.

The patterns that emerged were consistent, with all the LOs framed in accordance with the SMART criteria; they were also reasonably measurable, achievable and relevant, and able to be accomplished within the timeframe provided in each of the three lessons.

Teaching and learning approaches

In this section the teaching and learning approaches planned at the Paro College of Education is explored in order to ascertain how the lecturers planned to influence, motivate and inspire students to learn in their lessons.

Organises active/passive engagement with learning tasks

It was observed that the teaching and learning approaches employed in the creation of lesson plans were based on a range of activities designed to actively engage students during the lesson. The lesson plans revealed examples such as *group activity* as the main approach, followed by *group presentations* and *questions* listed in the *A Happy School* lesson plan (Pce.sorg.lp, 26 May 2010).

In the other two lessons, activities were also planned as part of the lesson development. In the *Action of Heat on Nitrates* lesson plan *experiment in pairs* was recorded as the main activity for engaging the students. Whereas in the *Coordinate Geometry* lesson plan, activities such as *identifying the coordinates, locating the positions, identifying shapes* and *playing games* described the lesson activities designed to engage the students. The module plans for these lessons also had activities listed (Appendix 7.2), suggesting that the module plans were used as the guiding framework for the organisation of active engagement with learning tasks.

Provides opportunities for interactions amongst students and with the lecturer

Opportunities for interactions with each other and with the lecturer were provided, as it is clear that interaction was expected in the activities listed. For instance students would be provided with opportunities to interact with each other and with the lecturer in the group activity listed in the *A Happy School* lesson plan, *experiment in pairs* in the Action of Heat on Nitrates lesson plan, and the games identified in the *Coordinate Geometry* lesson plan.

Initiates vigorous and critical interaction with knowledge content (invokes deep learning)

Although this particular indicator was not explicit in the lesson plans, it was implicit in the entire planning approach. The fact that activities and games were planned

for the lessons indicated that some vigorous interaction with the content was expected.

Therefore, the teaching and learning approaches observed in the lesson plans presented different activities planned by the lecturers to actively engage the students during the lesson. Interactions through the *group activities* planned in the *Coordinate Geometry* and *A Happy School* lesson plans, and pair work in the *Action of Heat on Nitrates* lesson plan specified the type of learning experience for students.

Content knowledge

Review of the three lesson plans revealed that the content knowledge was not separately described, although it was implicit in activities such as the *A Happy School* lesson, and in the Lesson Development component of the other two plans. Because details were not available, it is not possible to comment on the depth and breadth of the content knowledge. Details of the content knowledge will be observed explicitly in the implementation phase.

Review of the module plans indicates that content knowledge was explicitly described (Appendix 7.2). The module plans included details of both the depth and the breadth of the content to be covered. For example in the *School Organisation and Administration* module plan (which informs the *A Happy School* lesson plan), for example, the first topic *Meaning/Concept of School* listed six subtopics, examples of which include: *Types and levels of schools; Meaning of Organisation, Administration, Management and Leadership* (Pce.sorg.mp, Feb-July 2010). Similar patterns were seen in the *Teaching of Mathematics 2* and the *Extraction and Purification of some common Metals* module plans.

Therefore it could be acknowledged that since the lesson plans were based on the module plans, the details in the module plans provided adequate information about the content knowledge in general but not explicitly for each lesson.

Assessment

In this section, assessment methods contained within the lesson plans are examined, using the two indicators described in Chapter Three.

Selects, constructs and utilises appropriate assessment strategies

The assessment strategies mentioned in the lessons plans were mostly assessments of prior learning. It is noted, however, that the assessment strategies identified in the two (*Action of Heat on Nitrates* and *A Happy School*) lesson plans were only implied, as no tangible details were included. More information about assessment in lessons was obtained during the lesson observations.

Assessment strategies for the module plans, however, were summative and included examinations and course work. Course work assessments mainly consisted of *minor assignments*, *major assignments, unit tests, project work,* and *practicals* (Appendix 7.2). The module plans also contained details of the assignments and the Marking Criteria, a learner-centred practice that makes assessment requirements transparent for the students.

Assesses prior knowledge of student learning

Examples of assessing prior knowledge of student learning were described as *Brief Recap of previous lesson by asking questions* which was seen in the *Action of Heat on Nitrates* lesson plan (Pce.epm.lp, 25 May 2010), and *Brief recap of previous lesson* in the *A Happy School* lesson (Pce.sorg.lp, 26 May 2010) but the latter did not indicate the process by which this would be done. These practices could be interpreted as assessing prior learning in the beginning of the lesson as they were based on pre-existing knowledge and skill of the students on the topics. The *Teaching of Mathematics 2* lesson plan did not include any strategy for assessing prior learning.

Resources

Resources used by lecturers were examined in order to ascertain their variety and effectiveness for learning enhancement. Of the three lesson plans examined, only the one for the *Coordinate Geometry* lesson was accompanied by resources. These included worksheets and games, such as *Who scores the highest point? Hit or miss, Bingo Treasure Hunt* and *Concentration game* (Pce.tma.lp, 26 May 2010).

The prepared resources were appropriate for the LOs and the lesson activities. The resources were prepared with the intention to encourage and assist students in the

lesson activities in *Coordinate Geometry* so that they will be able to learn and later utilise the same with the children in the primary schools thus promoting effective learning in mathematics. Neither of the other two lesson plans included resources that could be used to promote student learning or enhance teaching.

On the other hand, two of the three module plans had a modest list of resources, including books and other materials (Appendix 7.2). The *School Organisation and Administration* module plan did not have any resources listed, just as it did not have the teaching and learning approaches listed.

Role of the teacher

In Paro College, the teacher's planning roles included curriculum development and resource organisation. The central role of the teacher was in deciding the LOs, content topics, resources to be used and the teaching and learning strategies of the lessons. The lecturers were also responsible for the modules to decide what would be taught, how it would be taught and assessed to ensure student learning.

Role of the student

There was little to suggest that students played any role in the planning phase in any of the three lessons or in the module plans. However, in the *Teaching of Mathematics 2* module, the lecturer included information regarding students' choice in the assessment tasks for the major assignment *1 major assignment e.g. compilation of a 'resource pack' or A book of games or curriculum review (IV-VI) or any other appropriate task as per their choice* (Appendix 7.2.2). The point that the lecturer deemed it important to allow students to choose the topic of the major assignment indicated that he was aware of the benefits of making it motivating, applicable, and valuable to the student. He clearly acknowledged the power of providing an appealing assessment task in improving learning outcomes. However, apart from this solitary incident, it was observed that the role of students in planning was considered to be passive - simply learning what the lecturers planned.

Summary

This section on Planning addressed the research question *What is the nature of*

lecturers planning that lecturers engage in as they prepare for their lessons?

This is the only College in the principal study in which lecturers provided written lesson plans for their lessons. The planning practices had finesse and were based on an understanding of pedagogical principles. They contained details not seen in the previous case studies, for example the variety of teaching and learning approaches incorporating active and deep learning strategies to complement the learning outcomes and assessment methods. The work of the lecturers suggested an awareness of pedagogical principles in the preparation of lesson and module plans. The comparatively well-developed LOs based on the SMART criteria were particularly encouraging and reflected the expertise of the lecturers. The assessment tasks were designed to review previous lessons, introduce the lesson, establish the learning context based on assessment of prior knowledge, and ask evaluative questions at the end of the lesson. The incorporation of such detail into the lesson plan indicates a thorough understanding of the teaching and learning principles. Therefore in conclusion, the planning practices demonstrated student -centred practices to a great extent with based on good understanding and application of pedagogical knowledge to the lesson plans.

Implementation

In this section the same seven categories are examined in order to address the research question: *How do the lecturers implement their prepared plans in a way that supports student learning?*

Learning Outcomes

The discussion addresses what learning outcomes were evident during implementation phase.

The planned LOs in the three lessons were mostly implemented, the exception being the fourth LO in the *Coordinate Geometry* lesson *Work out questions on coordinates*. (Pce.tma.lo, 26 May 2010). It was not implemented in the lesson, as the students did not frame questions on coordinates. The other planned LOs in the lesson were achieved through activities such as *locating places, drawing coordinates, playing games,* and *writing instructions*. Students demonstrated achievement of the LOs in the

Action of heat on Nitrates' lesson, as they were able to *investigate* the action of heat on two samples of Nitrate salts by conducting flame tests, *identify* the nitrate salts (Potassium Nitrate and Sodium Nitrate) and by conducting the experiment, *develop* practical skills of safety, observation and data tabulation as the students observed and recorded the practical results in an observation table (Pce.epm.lo, 25 May 2010). In the *A Happy School* lesson, students were able to identify the characteristics and define a happy school through group discussions.

Determining whether LOs had actually been achieved for the students was possible in this College as the involvement of the students in the learning activities organised by the lecturers ensured that all participated and learning took place.

Besides the implementation of planned LOs, several LOs that were unplanned were observed being implemented in the three lessons. Evidences of such practices were noted in the three lessons.

For example, in the *Coordinate Geometry* lesson, there were several unplanned personal-generic LOs observed in the lesson. The lecturer noted that students could apply the same principles and use the games while teaching mathematics in primary classes – an allusion to the transfer of skills and knowledge to their workplace. He also challenged the students to design their own games saying, *If you are creative, you can design your own games*. He cautioned the groups against *cheatin*g in the *Treasure Hunt* by stating that they would have to go through the procedures to find the treasure. Additionally, the lecturer set an example by taking care of the learning resources, when he asked for the dice sets back after the Bingo game explaining that he could use them for other math lessons. Modelling of such practices resulted in hidden LOs in the lesson such as transfer of skills and knowledge to the students' workplace, creativity in designing mathematical games, honesty while playing the games and maintenance of resources.

In the *Action of heat on Nitrates* lesson, personal-generic LOs such the lecturer's close monitoring and frequent reminders of safety measures, the lecturer conveyed the importance of ensuring safety practices during the performance of experiments in the

chemistry laboratory, particularly the handling of acids. She required that the students run through the routine although they were familiar with it, asked them questions and cautioned about the risks of using hydrochloric acid during the experiment. She also provided frequent reminders to the students to pay careful attention to the procedures of the experiment and to conduct the experiment systematically in order to be able to teach it in school.

In the *A Happy School* lesson the casual manner in which the activities were instructed and conducted did not model effective practice. The students were not provided with clear instructions for the group activity; and a task which could have been done in approximately 5 minutes was allotted 30 minutes.

In summary, in addition to the planned LOs, other unintended LOs were implemented in the lessons. The latter were largely unarticulated and had become embedded in the teacher-training programme and implemented by teachers who had incorporated them into their repertoire of teaching skills in response to their own training and experience.

Teaching and Learning Approaches

In this section the approaches to teaching and learning that influence, motivate, and inspire students to learn are examined using the indicators described in Chapter Two. Data from the *Lesson Observation records, Students In-Lesson Questionnaires, Staff and Student Interviews* and *Field Notes* is analysed.

Organises active/passive engagement with learning tasks

In the three lessons that were observed, a number of characteristics appeared in common. In the Planning Phase, the lecturers at Paro designed activities to engage the students with the lessons. 'Lecture' was not used as the main teaching approach. For example, in the *Coordinate Geometry* lesson, the lecturer organised games that involved active engagement between the students and the learning tasks. These included *Who reaches 20 points*? (*A dice game in which the first dice represented horizontal coordinates, and numbers on the second dice the vertical coordinates)*, *Hit or Miss (Starship)* (*players chose 15 points each to represent a starship then circled the 15*

points on the grid provided without showing their opponents', *Bingo* (which *required that the students mark the points called out by the lecturer to form the coordinates)*, *Treasure Hunt* (which required that *students follow the directions to find hidden treasure using the coordinates on a map*'(Pce.tma.lo, 26 May 2010). The lecturer used creative ideas to introduce the lesson, such as asking the students how to economically and quickly locate travel destinations around the world (used to introduce the lesson and bring out the concept of using coordinates in an atlas to locate places). He also told a story about an uncle who had left him money but had hidden it; he encouraged students to help him find it using a map (and named it *The Treasure Hunt* game). He also provided demonstrations before each activity to ensure that all understood the instructions. The concrete representation of the tasks allowed students to relate to the information presented. The demonstrations and creative use of ideas to introduce sections of the lesson modelled excellent practices by which students could learn themselves and which could later be used in primary mathematics classes that they would later be teaching. Students were completely engaged in the activities and although the games themselves were easy (as they were designed for primary school students) the involvement in the activities stimulated students to think about what they were doing. Besides there was enjoyment and students were observed to be very animated and engrossed in the activities. The lesson was fast paced, and the lecturer was very lively, used humour while explaining the games, and was adept at engaging and motivating students. He moved very smoothly from one activity to the next, causing little disruption (collecting the dice and rearranging groups), which demonstrated the confidence and skills that his years of experience had given him. The lecturer also made the students aware of the higher order learning that was taking place in the lesson when he made references to the application and design of such mathematical games to the primary mathematics' classrooms (Pce.tma.lo, 26 May 2010).

Similarly in the *Action of Heat on Nitrates* lesson, the students were initially engaged by the lecturer's instructions, which focussed on the link between theory and the practical properties of Nitrates. The students, in pairs, then proceeded with the practical exercise which was to find the nature of the salt before heating (colour, odour

and state), then the solubility and nature of salt upon heating (melting, sublimation, crackling sound, colour change). They conducted the flame test in order to identify the two salts provided for the practical exercise, and recorded their observations under *Appearance, Experiment (procedure), Observation, Inference* and *Conclusion* on the previously-prepared sheet (Pce.epm.lo, 25 May 2010). The students worked diligently and were actively engaged throughout the lesson (one at each work-station) busy conducting the experiment, discussing, and recording their findings (Pce.emp.lo, 25 May 2010).

In the *A Happy School* lesson, the students were kept engaged by a group activity in which they identified the characteristics of a *Happy School* and defined it using those characteristics. However, the pace and quality of the lesson was not as intense and deep as in the previous two lessons even though the students were kept engaged. Some of the groups completed the task very quickly. Also the initial instructions for the activity were not clear and the lecturer had to go around to the groups to explain the instructions again (Pce.sorg.lo, 26 May 2010).

In summary, the level of student engagement in the lessons observed was high, and although engagement was not as high in the *A Happy School* lesson, as in the *Coordinate Geometry* and *Action of Heat on Nitrates* lessons, students were clearly engaged with the learning tasks.

Provides opportunities for interactions amongst students and with the lecturer

In the three lessons, opportunities were provided for students to interact with each other as well as with the lecturer. In the *A Happy School* lesson, students interacted with each other in their groups, identifying and discussing the characteristics that defined a happy school for them. There were 4-5 members in each group, which allowed sufficient opportunities for cooperation, discussion and deliberation on the characteristics that might define a happy school. The students also interacted with the lecturer who moved through the class during the group activity – listening, giving more instructions, clarifying doubts and checking the groups at work. Interaction also took place when the groups presented their findings to the class; the lecturer made some

comments and when the groups worked on the definition of *A Happy School*, he went to each group asking them to modify and make the definition more specific. However, it was observed that when the groups presented the definitions and the lecturer asked the other groups to 'react' to the definition, none of the groups took the challenge and remained quiet. (Pce.sorg.lo, 26 May 2010).

Student interaction was greatest in the *Coordinate Geometry* lesson as there were several activities that kept them engaged and provided them with ample opportunities to interact among themselves as well as with the lecturers. For example, as explained earlier there were five games on coordinates that were played in pairs (dice game for *Who reaches 20 points*) as well as in small groups (4 members in the *Hit or Miss -Star ship*). There was a lot of interaction among students in these activities. Interaction with the lecturer was also observed when he monitored the activities by going around to the groups/pairs listening, clarifying doubts, checking the groups/pairs at work, When the students shared their answers, he provided feedback and suggested ways to use the activities in schools.

Similarly in the *Action of Heat on Nitrates* lesson, there was interaction between the students as they worked in pairs to conduct the experiment as well as with the lecturer who actively monitored them at work, spending time, explaining, and commenting on their progress (Pce.epm.lo, 25 May 2010).

In summary, in all three lessons, opportunities for student-student and student-lecturer interactions were provided. Since the lessons were activity-oriented, they logically called for interaction in the class although the levels of interaction varied across the three lessons.

Initiates vigorous and critical interaction with content knowledge (invokes deep learning)

In all three lessons, considerable levels of vigorous and critical interaction with content were observed. For example in the *Action of Heat on Nitrates* lesson, the students were required to apply what was learnt in the theory lesson to the practical exercise they were conducting. They were able to recognise the characteristics (colour, smell, sound when put on heat) of two Nitrate salts and identify the two salts. Fairly

vigorous active interaction with the content was observed leading to deep learning (Pce.epm.lo, 25 May 2010). A comment in the *In-lesson Questionnaire* implied that students thought that the learning would be useful:

- *I think we will not have problem to teach below class XII subject* (Pce.epm.lq, 25 May 2010).

Similarly, in the *Coordinate Geometry* lesson, the students interacted with the content fairly vigorously during the games as they had to apply the principles of coordinates. For example in the game Bingo, it was necessary for them to know and understand what coordinates are and how to read them and mark then on the grids. The other games too were based on sound content principles and promoted fairly deep learning in a fun-filled atmosphere of seemingly uncomplicated games. Student comments in the *In-Lesson Questionnaire* corroborated this observation:

- *I know that through games we can teach the mathematics*;
- *So many activities were done which was relevant to the topic;* and
- *This module is really helpful for maths B.Ed (Primary)* (Pce.tma.lq, 26 May 2010).

In the *A Happy School* lesson, an example of students' interaction with the lesson content occurred during group work when they identified the characteristics and defined a happy school. There were not many comments beyond noting the interactive nature of the lesson in the *In-Lesson Questionnaire* but a few corroborated the observations of the researcher:

- *Teaches let us to discuss in groups* [sic]; and
- *It was learner-centred, collaboration learning, good content* (Pce.sorg.lq, 26 May 2010).

In summary, activities were conducted to engage the students and provide opportunities for fairly vigorous interaction with the lecturer and with the content of the lesson. The lecturers skilfully incorporated the principles of teaching and learning into their lessons.

Content Knowledge

Relevance, depth, and breadth of content knowledge taught in the three lessons

are now assessed. Research observations were made in classes in the B.Ed Primary Year 3 and Year 2 levels, and provide the data for this section of analysis.

Depth and Breadth of content

Varying degrees of depth and breadth of content were illustrated in the three lessons observed. For example, the lesson *Action of Heat on Nitrates* provided adequate content which focussed on investigation of the action of heat on nitrates and identification of two nitrate salts. The lecturer began by providing an overview of the lesson content and then described the practical exercise, its content and the procedural and safety measures of the experiment in some detail, The depth and breadth of the content appeared appropriate to the level and requirements of the lesson. The fact that students were able to conduct the experiment successfully was evidence of the lecturer's thorough presentation of the content (Pce.epm.lo, 25 May 2010).

In a similar way, the depth and breadth in the *Coordinate Geometry* lesson were adequate and suitable at the primary maths level. Using activities and games, the lecturer covered the content of the lesson including the coordinate plane, coordinates of a point and distance between two points. Here was more evidence of the success of facilitating games that allowed students to find solutions was a reflection of the adequacy of the lesson content (Pce.tma.lo, 26 May 2010). Presentation of content in both of these lessons content was well paced and suitable for the timeframe.

In the *A Happy School* lesson, although the topic was relevant and significant for the students training to become teachers, the depth and breadth were inadequate. The group activity and the presentations demonstrated the meagreness of the content. As explained above, the group activity planned for 30 minutes was clearly overestimated. During the group presentation, it was revealed that because all the groups had very similar characteristics, the group presentations were not actually necessary. After the first group listed the characteristics, the other groups did not have much to share. Therefore, the depth and breadth of the lesson had not been thought out carefully. The group activity instructions were also not very well organised as the lecturer had to interrupt the groups to reinforce instructions even after they had been given at the

beginning of the lesson (Pce.sorg.lo, 26 May 2010).

Links content to other subject areas and everyday life of students

The contents of the three lessons were evidently linked to the roles that students would be likely to fulfil on completion of the B.Ed. For example, the students in the *Coordinate Geometry* lesson were frequently reminded about how they could conduct such activities in the mathematics class in primary schools. The lecturer also briefed the class on how to design effective worksheets for such activities and offered students the opportunity to design similar games if they wished to be creative. (Pce.tma.lo, 26 may 2010).

Similarly in the *Action of Heat on Nitrates* lesson, the lecturer reminded students to conduct the practical carefully so that they would learn how to conduct similar practical sessions in schools. She also reminded them to be very thorough with the theory, as they would need to teach it to students in the schools in the future. In the *A Happy School* lesson, the link to the workplace was implicit as the lecturer urged the students to promote the characteristics of a Happy school in the schools they will be placed on graduating. Thus, the link to the students' potential future workplace was quite focussed and related to both the context of the lessons and the programmes in which the students were enrolled.

Assessment

The assessments used by the lecturers in the three lessons observed for this study are analysed using the indicators recorded in Chapter Two.

Selects, constructs and utilises appropriate assessment strategies (formative and summative)

Informal formative assessments were observed in the lessons. Work was done in student groups; there were student-teacher dialogues, class discussions, and questions to review understanding of information. Selection, construction, and utilisation of formative assessment were observed. For example, in the *Action of Heat on Nitrates* lesson the lecturer approached the pairs while they were working on the experiment and asked them questions like:

- *What happened when you heated Salt A/B?*
- *Did you hear a crackling sound?*
- *Did you see the colour of the fumes*?
- *Is there any smell?*
- *What did you observe happening at the bottom of the test tube*?
- *Have you noted your observations?* (Pce.epm.lo, 25 May 2010).

This was done to check whether the students understood the practical exercise. When it was clear that they were unable to provide or explain their answers, she patiently explained further. When the students completed the practical exercise, the lecturer recapped what had been done and asked the class to share their findings and recorded them on the chalkboard. This helped to assess whether the students had reached the same conclusions.

By asking questions and monitoring the students' progress, the lecturer informally assessed the students' learning. Since it was not carried out as a whole class activity it was effective and individualised. Because the lecturer went to each workstation and interacted with the students, the overall effect was motivating for the students as they asked questions, clarified doubts, and successfully conducted the experiment (Pce.epm.lo, 25 May 2010).

In the *Coordinate Geometry* lesson too the lecturer actively monitored the students during the activities to check their progress, to ensure that all the students followed the instructions for each game and did not take shortcuts. At the end of each activity, the students were asked to share their results with the class (Pce.tma.lo, 26 May 2010) which could be considered as informally assessing student learning.

A similar type of assessment was observed in the *A Happy School* lesson when the lecturer monitored the students during the group work. It differed, however, in that this time was mostly used to provide more instructions to students because the initial instructions were unclear. Thus he kept interrupting the students with more information and instructions during the activity (Pce.sorg.lo, 26 may 2010).

Assesses prior knowledge of student learning

This indicator was effectively carried out in the *Action of Heat on Nitrates* lesson where the lecturer assessed prior knowledge of student learning by asking questions about the previous lesson *Characteristics of Nitrates*. She encouraged the students to respond by prompting and established a satisfactory link with the theory. This was an important prelude to the practical exercise because the lesson's focus was to investigate the action of heat on Nitrates and observe the characteristics of two Nitrate salts.

However, in the *A Happy School* lesson the lecturer recapped the previous lesson *A Good School*, he simply ran through the information himself while the students listened, thus he did not establish a much more enduring context for the lesson.

In the *Coordinate Geometry* lesson, the lecturer began by presenting a problem to the students and then moved right onto the topic. There were occasions in the lesson when he assessed prior knowledge of the students, such the use of 'x' and 'y' axis in coordinates and other mathematical concepts related to the lesson.

In summary, assessment used in the lessons was mainly informal and formative. Lessons were also recapped using questions in order to establish the lesson context, and while monitoring the students during the tasks; the lecturer provided support and formatively assessed their learning. However, all three lessons did not have the same level and quality of assessment practices as the *Action of Heat on Nitrates* and *Coordinate Geometry* lessons were clearly at an advantage where the lecturers made a difference to the lessons by using informal formative assessment strategies effectively.

Resources

In the three lessons observed, the lecturers used resources to enhance their lessons. The Science laboratory itself was a resource for student learning in the lesson *Action of Heat on Nitrates*. As it was a teaching laboratory it was well-furnished and fitted with equipment such as glass test tubes, test tube racks, spatulas, pair of tongs, and samples of 2 Nitrate salts, appropriate for the experiment As there were 15 students, there were six dyads and one triad sharing workstations that were comfortable and

spacious. In addition to these physical resources, there was a laboratory assistant who assisted the lecturer and the students with the practical exercise. The students were productively engaged in the practical exercise, which was well-equipped with relevant resources (Pce.epm.lo, 25 May 2010). Feedback in the student *In-Lesson Questionnaire* supported the observation findings as 100% agreed that *The choice of learning materials were appropriate*, and 93% confirmed that *There was appropriate use of teaching materials* (Pce.epm.lq, 25 May 2010). This was an ideal situation in which relevant resources were available to promote student learning. Both lecturer and students used the available resources to maximum advantage (Pce.fld.nt, 24 – 29 may 2010).

In the *Coordinate Geometry* lesson, the lecturer used grid sheets, *coordinate* grids, activity/worksheets, and dice game sets as the main resources with which to engage the students. The lecturer was careful to collect the dice sets after their use (Pce.tma.lo, 26 May 2010). The resources used in this lesson were relevant, and significantly promoted student learning. On the *In-Lesson Questionnaire,* 100% of the students agreed that *The choices of learning materials were appropriate* and that *There was appropriate use of teaching materials*. Comments such as *The lesson was appropriate with good materials and games* (Pce.tma.lq, 26 May 2010) corroborated the observation findings.

On the other hand, in the *A Happy School* lesson, the lecturer used handouts on *Child Friendly School* and *Gross National Happiness* (GNH) *School* to assist the groups of students to identify the characteristics and definition of a happy school. However, it was observed that resources were not as effectively used as they were in the previous two examples. It is also possible that because there is an overlap of information between a GNH and a Happy school and because the necessary information was provided in handouts, the task was not very challenging. The resources did not enhance learning. Feedback from the *In-Lesson Questionnaire* highlighted the ineffective use of resources, with only 25 (twenty-five) percent of students agreeing that *There was appropriate use of teaching materials* and *The choices of learning materials were appropriat*e (pce.sorg.lq, 26 May 2010).

In the *Action of Heat on Nitrates* lesson, the use of resources was at a high level of complexity than the other two lessons. The well-furnished and stocked science laboratory supported the use of resources as the students interacted with the materials to observe and understand the concept of the changes that took place when the two nitrate salts were heated. In the *Coordinate Geometry* lesson, the lecturer prepared the resources when planning the activities and therefore creatively promoted student learning. Conversely, in the third lesson on *A Happy School* the use of resources was minimal and not very effectively used.

Role of Teacher

The role of the teacher is examined using the three indicators described in Chapter Three on the literature.

Creates conducive learning environments

The three lecturers demonstrated their ability to create environments conducive to learning by their use of cognitive space. For example, in the *Action of Heat on Nitrates* lesson, the lecturer used the laboratory facilities to advantage to promote student learning. She arranged with the laboratory assistant to set up the equipment and prepare early, so that when the lesson began, it ran smoothly (Pce.fld.nt, 24 – 29 May 2010). She provided clear and complete instructions for the practical experiment, explained the theory well and checked that students understood the procedure by asking them to repeat the instructions before they began. During the activity, the lecturer moved through the pairs of students, assessing their understanding by asking questions. She supervised to ensure that students followed the procedures and that safety measures were followed, and made suggestions where appropriate. As the class was small (15 students) the lecturer was able give individual attention and encourage the students in their learning. her diligence and commitment was very obvious in the lesson as she took such pains to ensure that the content, procedures, and safety measures were thoroughly understood by the students. As a result, the atmosphere in the classroom was a place favourable to learning (Pce.epm.lo, 25 May 2010). Students' comments in the *In-Lesson questionnaire* support these observations:

- *Excellent lesson, serious and genuinely interested with*

teaching as usual [sic];

- *Clear instruction and audible;*
- *Good monitoring;* and
- *Good content knowledge and lesson were well organized* [sic] (Pce.epm.lq, 25 May 2010).

Similarly in the *Coordinate Geometry* lesson, the lecturer planned several engaging activities to promote learning. The ease with which he organised the class into pairs and groups for the various activities, gave clear instructions, closely monitored them during the activities created a very favourable environment for learning. Although the desks and chairs were originally arranged in the traditional rows, he arranged for the students to move the furniture into a configuration that facilitated their interaction in the class. The effortless manner with which he handled the transition from one activity to the next, and allowed a level of noise as the students played the games, reflected confidence and lengthy teaching experience. Nothing ruffled him in the class, he was encouraging and used humour appropriately to create a warm and open atmosphere (Pce.tma.lo, 26 May 2010). Comments from the students in the *In-Lesson Questionnaire* validated the observation findings:

- *The lesson was well organised and structured;*
- *He connected the topic through games;*
- *Lesson was understandable, was able to make learners understand;* and
- *Good use of teaching skills* (Pce.tma.lq, 26 May 2010).

Similar patterns were seen in the *A Happy School* lesson in which the lecturer created an environment in the classroom that was conducive to learning. However, the failure to provide clear instructions fro the group activity initially made additional work for the lecturer, as he was then obliged to clarify his instructions in the small groups. This had an added complication for the students, as in telling each group individually, he may have introduced variations to his instructions. As some groups waited for him to clarify what he wanted them to do, they needed more time to complete the task. The effect on the classroom was that students were in various stages of carrying out the task (Pce.sorg.lo, 26 May 2010).

Encourages students to accept responsibility for their own learning and accommodates the diverse learning needs of all learners

The lecturers in the three lessons provided opportunities for students to shoulder greater responsibility of their learning by engaging them in activities. For example, as discussed in earlier sections, there were mathematical games in the *Coordinate Geometry* lesson. The students were encouraged to work out the solutions to the games and paly them successfully.

A similar pattern was observed in the *Action of Heat on Nitrates* lesson. In conducting the practical experiment, the students wee able to successfully carry out the experiment and arrive at the expected results. However, the situation in the *A Happy School* lesson was different. Although the lecturer organised group work in which the students were to identify and discuss the characteristics of a happy school, the lecturer's instructions were neither clear nor complete. It was, therefore, necessary for students to seek clarification, thus taking responsibility for their learning (Pce.sorg.lo, 26 May 2010).

Demonstrates an understanding and in-depth knowledge of content and maintains an ability to convey the content to students

The three lecturers demonstrated content knowledge and an ability to convey information to the students. This was evident in the way the lecturers explained the content, organised learning activities and managed the learning environment.

In the *Action of Heat on Nitrates* lesson, the lecturer demonstrated comprehensive content knowledge when explaining the characteristics of Nitrates, established a direct link with previous lesson, gave clear instructions for the experiment, checked that students understood the instructions, monitored the students closely during the activity, and arranged for the students to present their findings and summarise the lesson (Pce.epm.lo, 26 May 2010). One comment on the *In-Lesson Questionnaire* validates the researcher's observations that the lecturer demonstrated appropriate pedagogical content knowledge in the lesson

- *Good content knowledge and lesson were well organised* [sic] (Pce.epm.lq, 25 May 2010).

The lesson was underpinned by both subject-content knowledge and an understanding of pedagogy. Effective procedures maximised the learning experiences of students.

In the other two lessons *Coordinate Geometry* and *A Happy School* the lecturers had planned lessons, effectively incorporating both subject-content and pedagogical content knowledge. Comments regarding the *Coordinate Geometry* lesson on the *In-Lesson Questionnaire* corroborated the observations of the researcher:

- *Good use of teaching skills*;
- *The lesson was well organised and structured;* and
- *He connected the topic through games* (Pce.tma.lq, 26 May 2010).

Similar comments about the In the *A Happy School* lesson appeared on *the In-Lesson Questionnaires:*

- *The lesson was effective and it is student centred;* and
- *Good classroom management, class was well organised* (Pce.sorg.lq, 26 May 2010).

In summary, the lecturers in this the role demonstrated an understanding and in-depth knowledge of content and maintained the ability to convey it efficiently to the students. The practices of the lecturers in the lessons were certainly inclined towards learner-centred practices, with students engaged in activities, and there were a range of interactions provided to support student learning.

Role of Student

The role of the student is examined using the three indicators described in Chapter Two.

Accepts responsibility for their learning

In the lessons observed for this study, the data indicated that the students were more active in accepting responsibility for their learning than their counterparts in the other Colleges. This may be explained by the fact that participation in the activities was compulsory. In the *A Happy School* lesson, students (in groups of six were required to identify the characteristics of, and to define a happy school. They took responsibility for their learning by reading the handouts provided, and discussing the characteristics of a

happy school in their groups. At the end of the allotted time they shared their lists with the class, though in this lesson that was not very onerous. The groups all reached fairly similar conclusions, which meant that after the first group presented their report, successive groups had little to add. Students recorded their findings on the chalkboard and then groups defined 'a happy school' using the characteristics. The success of the lesson depended on the students' efforts and the lecturer's support and encouragement from the lecturer (through monitoring).

In the other two lessons, students took responsibility for their own learning by playing the coordinate games in the *Coordinate Geometry* class and conducting the experiment in the *Action of Heat on Nitrates* lesson. However, students were unable to *independently* accept responsibility for their learning as the lessons were organised in such a manner that they had to participate in the lesson activities. Students were prevented from making any decisions regarding what they were to do and how they were to do it. Therefore, although the lessons were good examples of active learning, they did not permit the students to make independent decisions. They played the games and performed the experiment as decided and arranged by the lecturers and not how they would do it. Nevertheless, the lessons in the College allowed students a certain degree of independence while they interacted with each other and the lecturers and performed the tasks in taking responsibility for their learning.

Actively participates in the class

In the three lessons, the students were observed to actively participate in the class, as the lessons required that they participate for learning. The lecturers planned for activities to be conducted in pairs or small groups, thus placing responsibility of participation on the students. Students' active participation was observed in all three lessons. They played coordinate games, performed the experiment and discussed characteristics and definition of a happy school. In two of the three lessons (*Coordinate Geometry* and *Action of Heat on Nitrates*) activities were fairly well thought-out and organised, whereas the activity in the *A Happy School* lesson was not as well-organised as explained earlier. Nonetheless, the students showed a lot of interest and enthusiasm in the activities, responded to the questions and readily got into groups or pairs for the

activities. They indicated their awareness of what was expected of them in the lessons.

Collaborates/teams with other students

The three lessons required that students work in pairs or small groups, which provided sufficient opportunity for them to work cooperatively. In the *Coordinate Geometry* lesson, the students played the coordinate activities in pairs and small groups, giving them opportunities to learn from one another, interact, share ideas and collaborate. In the other two lessons, students learnt, shared ideas, participated enthusiastically and collaboratively and with interest, thereby enhancing their own learning.

Summary

The preceding section attempted to answer the question: *How do the lecturers implement their prepared plans in a way that supports student learning?*

The observational data suggests that the lecturers in the College were aware of their professional role, and recorded their implementation of a range of strategies (games, practical exercise and group activity) in the classes other than 'lecture'. Encouraging students to work in pairs or groups provided enormous advantages not available from more traditional instruction because a group could accomplish meaningful learning and solve problems better and thereby promote deep active learning. The lecturers facilitated learning rather than merely transmitting knowledge to the students; they valued students' participation in the class and employed activities to build upon their knowledge, skills and values. In all three lessons they simultaneously did this while providing information.

The assessment practices were mainly informal and formative, such as asking questions, recapping the lesson to assess prior knowledge, and close monitoring of activities to provide feedback to the students during the activities. The lecturers modelled some effective practices. The resources used were relevant and the lecturers made the most of their knowledge of pedagogy in order to facilitate learning in the lessons.

In conclusion, it was encouraging to note that the lecturers used a variety of

activities other than the ubiquitous lecture and were able to promote active and fairly deep learning for the students.

Evaluation

This final section of the case study, includes an evaluation of the findings in the planning and implementation phases to answer the research question *To what extent do the planning and implementation practices of the lecturers support student learning*?

Two main issues are focussed on: i) the congruence between what was planned for each lesson – as described in the planning section – and what was actually implemented in the lessons – observed in the implementation section and ii) the impact of these practices on student learning vis-à-vis the seven categories identified in the analytical framework.

Learning Outcomes

This section explores the degree of congruence between the planned LOs and those that were actually implemented. The discussion takes account of the alignment of the LOs with the teaching, learning and assessment as alignment maximises the conditions for quality learning. As has been the practice in the reporting of the previous case studies, comments regarding the construction of LOs preface their evaluation.

Construction of Learning outcomes

The lecturers' LOs were well-written when assessed using the SMART criteria, viz. specific, measurable, achievable, relevant, and time scaled. Eight of the nine LOs were subject-specific with one as personal-generic, reflecting an emphasis on knowledge enhancement (Table 7.1). They were written using appropriate verbs to describe what the students were expected to achieve as a result of the lessons. They did not describe teaching intention; the focus was therefore on the student. The application of the Bloom's Revised levels of thinking revealed that there was a somewhat higher percentage of lower levels of thinking (56%) than higher levels (44%) in the LOs. While it has been discussed in the literature that LOs should be pitched at the higher levels of thinking in tertiary education, there is also a counter argument. Hussey and Smith (2002) effectively argued that learning does not occur in a linear manner, moving

from remembering to analysing and that lower levels are as significant as the higher levels of thinking in the learning process.

Consequently it can be construed from the findings that besides the 'issue' with levels of thinking, the LOs were well-constructed, and their design promoted student learning.

Congruency of LOs

Discussion on the congruency of LOs examines the extent to which the intended LOs – those described in the lesson plans – were implemented in the lessons and whether the other LOs which were not planned, but which were implemented during the lessons.

There was general congruence between the planning and the implementation of the LOs. While the intended learning outcomes were to a large extent implemented as planned in the lessons, the other unintended, unplanned 'hidden' personal-generic LOs too were evident that guided the lessons.

The planned LOs were successfully implemented in the lessons, resulting in a positive outcome (with the exception of one LO in the *Coordinate Geometry* lesson). The unintended personal-generic LOs were also observed taking place along with the planned LOs and had considerable impact on the lessons. They were beneficial in that they enhanced the learning experiences of the students. In the *Coordinate Geometry* lesson, students became aware of the significance of coordinates in the games, acquired ideas about how to design games (which was not the intended LO of the lesson), observed the lecturer taking care of the resource and, motivating students by careful monitoring. Thus the students learnt several valuable lessons other than those that appeared in the lesson plan. These were significant lessons as they helped to instil professional values, which were modelled by the lecturer, in the students. Students also appeared to be aware of the significance of the games and made notes to use them later in the teaching (Pce.tma.lo, 26 May, 2010). These aspects of the lecturer's teaching provided 'hidden learning' that occurred alongside the planned LOs.

The 'hidden curriculum' which was included in the *Action of Heat on Nitrates*

lesson also had LOs which were not part of the formal lesson plan, but through which students learnt other valuable lessons such as how to conduct similar experiments in the schools, the importance of careful planning and setting up the laboratory in conjunction with the laboratory assistance prior to the beginning of class. The meticulous and careful manner of the lecturer was exemplary in modelling good practices while conducting science practical sessions, which would be repeated by the education students in schools. These were significant lessons that students were sensitised to during the lesson, and which would assist them later in their teaching.

Conversely the impromptu and unstructured way in which the *A Happy School* lesson was presented was an undesirable exemplar. Too much time was allocated to the activity, instructions were ambiguous and the task was unsuitably simple for a tertiary class. These aspects of teaching indicated a failure to invest the necessary thought and effort into preparing this lesson, as was done in the Chemistry and Primary maths lessons. To the observer, the group activity looked more like 'busy work' to engage the students for thirty minutes on a simple task than, to promote serious learning. Since students were being trained to become teachers, this casual approach could send undesirable messages to the students conveying to them that the planning and preparation of appropriate and stimulating activities for learners is not really important, and that lessons may depend on spontaneity in the classroom. Spontaneity is good especially when teachers rise to situations or 'teachable moments' in the lesson, but not when it is essential because of a lack of forethought and preparation. Thus the 'unintended' LOs, did not contribute positively to an environment that promoted learning; but did send a 'wrong' message to the students about the role of planning and so did not have the same positive impact on the quality of learning as occurred in the other two lessons.

It was apparent in the three lessons that the activities centred on the core LOs, whereas the 'hidden' LOs were on the periphery, and merely scaffolds the lessons. The 'hidden curriculum' mostly benefitted the learners, and was learner-centred, but there were also some practices, that were less positive, and which would not help the students in their future teaching careers.

Alignment of LOs

Effective teaching aligns teaching, learning, and assessment to the learning outcomes, so that all components are in harmony and support student learning (Kennedy et al., 2006).

Analysis of the planning and implementation phases clearly showed that the LOs were, to a great extent well-aligned with the teaching, learning, and assessment practices in the three lessons. Examples of alignment were observed in the lessons as group/pair/individual activities were used in the teaching and learning approach, informal formative assessment provided by recapping previous lesson and more significantly active monitoring of the students as they performed tasks. The presence of activity-based learning and informal formative assessment indicated that these three aspects of the lessons were clearly aligned. These findings strengthened the expectations of teacher educators to be aware and be able to align their lessons. Doing so had led to some levels of deep and active learning among the students. As emphasised by Biggs (1999), in such a set-up the learner cannot escape learning as the LOs, teaching and learning approaches and assessment are closely linked with the intent to promote learning and that was what occurred in the three lessons.

Teaching and Learning Approaches

This section examines the congruence between teaching and learning approaches and the planning and implementation phases in order to ascertain their support for student learning.

Activity-based teaching and learning strategies such as group activities, group presentations and working in pairs were included in the teaching and learning approaches. While these were implemented in the lessons according to the planned LOs, other observations regarding the teaching learning approaches were made. The first observation was that 'lecture' was not the predominant mode of teaching in the classrooms. A second observation was that the lecturers frequently employed activities, as the students fell into their groups automatically and the lecturers did not have to spend time organising them. This familiarity with engaging in activities in the classroom reflected the learning culture in the College. The lecturers modelled active

learning which provided the students with a very clear picture of what was expected of them and also acquired ideas for their own use later, when they would be called upon to teach same topic in schools.

The learning activities provided fairly significant to moderate cognitive and psychomotor challenges to the students, as they were required to perform an experiment in the *Action of heat on Nitrates* lesson, play games on coordinates in the *Coordinate Geometry* lesson, and discuss in groups in the *A Happy School* lesson. The activities were not only focused on the content but also on pedagogy, as the mandate of the College was to train teachers. When compared with the other Colleges, there is an added dimension to learning at Paro. It was asserted that because the students already knew the content, the lecturers' job was to provide opportunities for them to acquire a richer content knowledge. One lecturer said:

> ➢ *I want to help students to learn things they do not know, but since the module content are familiar with the students, we go more in-depth*. (Pce.acs.int, 24 May 2010).

This implied that the students had to learn for a predetermined purpose, which was to teach, and therefore required that they understand the content more deeply and thoroughly. Therefore, in addition to the subject knowledge pedagogical content knowledge (Shulman, 1986) has to be mastered by the students in order to be able to teach effectively in the schools. The instructional processes in the lessons were embedded in contextual teaching and learning so that the students gained real-life perspective of the teaching profession. Students were thus motivated to make connections between knowledge and its applications in meaningful contexts in their future workplaces. The idea of contextual learning is designed to encourage students to learn together, and from each other as observed in the three lessons for which the lecturers had organised group/pair activities.

The teaching and learning approaches implemented by the lecturers in the three lessons were learner-centred resulting in active, and deep learning taking place. The *Action of heat on Nitrates* lesson involved deep learning through the experiment as the students were able to conduct the experiment successfully and were able to identify the

characteristics of Nitrates as learnt in the theory lesson. They were able to establish the link between theory and practice, suggesting a deeper approach to learning as the knowledge was transferred to the practical learning situation (Pce.epm.lo, 25 May 2010). Some of the students' comments in the *In-Lesson Questionnaire* supported such an observation:

- *Everyone is actively involved in class, given chance for interaction;*
- *Clear and understanding lesson* [sic]; and
- *Involved students in discussion* (Pce.epm.lq, 25 May 2010).

Additionally the laboratory activity was designed and conducted to engage students in pairs, with teacher guidance and structured directions. According to Tobin (1990, p. 405 as cited in Hofstein & Mamlok-Naaman, 2007, p. 106) 'Laboratory activities appeal as a way to learn with understanding and, at the same time, engage in a process of constructing knowledge by doing science'. He also asserted that meaningful learning is possible in the laboratory if students are given opportunities to manipulate equipment and materials in order to be able construct their knowledge of phenomena and related scientific concepts. In the lesson observed, students were given the opportunity to construct their knowledge by manipulating equipment and materials to investigate the action of heat on two Nitrate salts (Pce.epm.lo, 25 May 2010).

In the other two lessons, students were also actively involved in their learning. In the *Coordinate Geometry* lesson, they played games applying their understanding of coordinates and created ways to design similar games. In the *A Happy School* lesson, groups of students engaged in meaningful discussions about the characteristics and definition of a happy school. By the end of the lesson they had developed their own clear definitions. Although the lecturer's instructions were not clear and required further explanation, the students showed initiative and worked well in a group. The activities in the three lessons roused students to think, observe, play coordinate games following procedures, perform the experiment, and record findings, as part of their learning.

Evidence from the students' comments in the *In-Lesson questionnaire* indicates that the three lessons were typical when compared to previous lessons with the same

lecturers, even though there were differences in the students' responses. For example, in the *A Happy School* lesson, almost 65% of the students agreed that the lesson was typical, and made comments like:

- *Teacher everyday teaches in same method*; and
- *Yes lecturer did the same, what he used to do in previous lesson.*

Only 20% did not agree that the lesson was the usual type, and 15% did not comment (Pce.sorg.lq, 26 May 2010). The way the lesson was organised would not require much effort on the part of the lecturer, as it was a 'prototype' lesson on group discussion, which was quite commonly used in the two Colleges of Education. Other comments in the *In-Lesson Questionnaire* such as:

- *I would say that very lesson he taught was interactive;*
- *Lesson was interactive and learner-centred;* and
- *Overall the lesson was good. All the students were actively participated in the class* [sic]

suggested that the lesson was usual and not prepared especially for observation. In the *Coordinate Geometry* lesson although 80% of the respondents concurred that the lesson was typical of previous lessons with the lecturer, a comment:

- *Comparing to previous lesson, I found this lesson much interesting because Sir came up with games and two activities*' (Pce.tma.lq, 26 May 2010)

was revealing and may have implied that such activities were not organised for other lessons. As noted in the Implementation section, this lesson was fast-paced and included a lot of activities – fives games for one hour (when compared with only one group discussion in the *A Happy School* lesson for the same duration) and could perhaps be understood that it was a lesson prepared for observation. Whatever the situation, the lecturer exhibited a great deal of experience and expertise while teaching and he did it apparently effortlessly so it is difficult to assess whether it was a one-off lesson or it if was an example of his normal teaching practice. The *Action of Heat on Nitrates* lesson was clearly presented in what was the teacher's normal way, which was confirmed by students' comments in the *In-lesson Questionnaire:*

- *she always prepared lesson beforehand and she always respects our viewpoints;* and
- *She is always prepared* (Pce.epm.lq, 25 May 2010).

In summary, there was clear congruence between the lessons as planned and the lessons as implemented and overall the focus observed in the lessons was on active and learner-centred approaches.

Content Knowledge

This section examines whether there was congruence between the planned and implemented content knowledge in the lesson.

As mentioned in the planning section, content was not listed separately in the lesson plans. It could, however, be inferred from LOs such as *Investigate the action of heat on Nitrates and Identify the nitrates and develop practical skills* which appeared in the *Action of Heat on Nitrates* lesson. The same reasoning can be applied to the *A Happy School* and *Coordinate Geometry* lessons, in which the content was indicated by the LOs. Implementation of content in the lessons was to a large extent guided by the LOs and the lecturers had organised the lesson activities to complete the selected content. However, as discussed in the implementation section, the content in the *A Happy School* lesson was comparatively undemanding of itself as well as in comparison with the other two one-hour lessons. Moreover, as the previous lesson had been on *A Good School* and *a GNH School*, it was not clear why an hour would be required to discuss the characteristics and definition of *A Happy School*. An activity comparing the three kinds of schools would have been more appropriate as it would have given the lesson content more depth and breadth.

Based on the observations and the lesson plans, it is clear two of the three lessons (excluding *A Happy School*) contained depth and breadth of content appropriate for students to learn and then later transfer to the school situation in which they would eventually find themselves. The other feature, which was discussed earlier in Teaching and Learning approaches, is the focus on pedagogical content knowledge (PCK) which is essential for teachers. The teacher's interpretations and transformations of subject-matter in the context of facilitating student learning (Shulman, 1986) is relevant in the

context of the College as it is one role of the lecturers to model good teaching and learning practices to the students, as well as teach content. I observed that PCK was well-utilised in the *Action of heat on Nitrates* and *Coordinate Geometry* lessons with lecturers demonstrating ways in which the students could teach the same topics in the schools. This was not unexpected as the lecturers in the college have suitable teaching qualifications and experience (Paro College of Education, 2010). Student comments on the *In-Lesson Questionnaire* with, regard to the *Action of Heat on Nitrates* included lesson included:

- *Content is good and links the present lesson (practical) with previous lesson (theory);*
- *I think we will not have problem to teach below Class XII;* and
- *Good content knowledge and ways of explaining* (Pce.epm.lq, 25 May 2010).

And with regard to Coordinate Geometry lesson:

- *This module is really helpful for maths B.Ed Primary* [sic]; and
- *I know that through games we can teach the mathematics* (Pce.tma.lq, 26 May 2010).

In summary, the data makes it clear that there is evidence of congruence between the content knowledge that was planned and implemented in the lessons. The content in the lessons were guided by the learning outcomes.

Assessment

This section examines the congruency between the assessment that was planned and what was actually implemented in the three lessons, and to evaluate whether assessment supported student learning. Informal formative assessment was the most commonly used method of assessment used to evaluate student learning.

Assessment strategies planned for the lessons were recorded in the lesson plans as recapping what was included in previous lesson by asking questions of students in the beginning of the lesson and by summarising the lesson at the end. Assessment of prior learning was observed at the beginning, during and while summarising the lesson.

In the implementation phase, informal formative assessment was observed in the form of asking questions during the monitoring of activities, and providing feedback to the students on completion of activities. Generally such assessment is performed to prompt students to think through their responses and then for lecturers to use the information collected to support student learning by developing understanding during everyday whole-class conversations (Ruiz-Primo & Furtak, 2007). However this kind of assessment cannot be planned because it can happen at any time and does not involve any specific activity for students. Nonetheless, since the lecturers in the College were trained teachers they could skilfully incorporate it in their lessons and use them quite effectively. They could also make corresponding adjustments to their teaching (during monitoring the activities), responding in real time and thus providing significant supporting for student learning.

Further, the LOs were explicit, clearly indicating what the students were to achieve by the end of the lessons. The evidence suggests that there is congruence of LOs and assessments. When the students could identify the characteristics of action of heat on the two Nitrate salts and record them correctly in the *Action of Heat on Nitrates* lesson, the lecturer could assess their learning and whether the students understood the lesson topic. The same interpretation is used for the other two lessons in which the lecturers informally assessed the students' learning through the LOs.

The only form of summative assessment evident in one of the lessons was the records made by students in the supervised practical experiment in the *Action of Heat on Nitrates* lesson. It formed part of the continuous assessment, which would lead to the summative assessment. In the classroom, however, they were not formally being assessed but assisted in the process of learning to perform the experiment correctly (Pce.fld.nt, 23 – 29 May 2010).

Resources

This section analyses the congruency between 'resources' in planning and implementation phases and their impact on student learning.

In the planning phase, besides the *Coordinate Geometry* lesson, the other two

lessons had not listed the resources to be used during the lessons. However in the implementation of the lessons, various resources such as equipment for experiments, and PowerPoint presentation were utilised in the *Action of heat on Nitrates* lesson. Handouts on a good school and a GNH school were used in the *A Happy School* lesson. This clearly showed that there was little congruence in the use of resources between what was planned and used in these two lessons. On the other hand, there was congruency of resources planned and implemented in the *Coordinate Geometry* lesson.

Use of these resources greatly enhanced the quality of student learning as well as the lesson. The resource sheets in the *Coordinate Geometry* lesson and the laboratory equipment and materials in the *Action of Heat on Nitrates* lesson had been selected with care to enhance student as well as assist the lecturers in their teaching. Without the resources the lesson would not have been so successful and enjoyable. The practical experiment strengthened the students' understanding. There is evidence that practical work can increase students' sense of ownership of their learning and can increase their motivation (Dillion, 2008) as observed with the students in the Chemistry practical lesson. On the other hand, handouts *on Child Friendly School* and *A Gross National Happiness* School did not greatly enhance student learning as they made very few references to the information in the handouts (Pce.sorg.lo, 26 May 2010).

The physical setting of the classrooms was not a concern in this college as the classrooms and the science laboratory were spacious, and well ventilated and the student numbers ranged from 15 to 30 in the lessons. Such physical settings impacted on the quality of learning as the rooms were not congested, numbers of students were manageable for effective interaction with the lecturer and the lecturers too could move around monitoring the students as they performed their tasks. However, data from the staff interview with other lecturers presented a different situation in the college related to the physical setting and materials:

- *Large student numbers/congestion – about 35-40 students per class is large to give individual attention;*
- *The physical size of the class is small meant for 25 and we have 35-40 squeezed into the room. Makes it difficult for movement* (Pce.aca.int,28 May 2010); and

- *Poor learning environment with no equipment/apparatus/resources* (Pce.aca.int, 24 May 2010).

Apart from the physical setting and materials, students and staff in the interviews also brought to attention the lack of learning resources and inadequate copies of reference books, which impacted on their learning:

- *Library references are not adequate, sometimes there is only 1 copy of the reference and all the students require it;*
- *We have lots of problems like hardly any course packs are provided for the modules, printing and photocopy expensive and not working at times, not sufficient for us students as we are large in number*; and
- *Very few references. Mostly Class 11 and 12 textbooks in the library* (Pce.aca.int, 27 May 2010).

In such a setting where resources are scarce and student enrolments large, student learning can be limited. Moreover, since textbooks were not used in the programmes it is essential to get adequate and effective library references as well as expand the IT services and facilities so that students could have access to resources for their learning.

The role of resources in supporting and enhancing the quality of student learning is clearly significant. Analysis of the data related to the planning and implementation of resources indicates that there was some congruence between the resources that were used and those that had been planned for, and that additional resources were used during the lessons, further enhancing learning. It is significant that resources should, and were usually used to add value to the learning experience for students, not just for the sake of using resources, which was observed in one of the lessons.

Role of Teacher

Observation of the lecturers during their in-class teaching indicated that they had taken on the role as facilitators of learning rather than transmitters of information. The evidence can be found in the lessons they planned and implemented. Even while planning the lesson plans the lecturers had written:

- *At the end of the lesson each trainee should be able to*

indicating the focus on each student's learning. This was a very learner-centred characteristic, as the lecturer did not look at his/her class as a mass of students but rather as many individual members, each of whom had potential. From the onset, the lecturers took on this role and organised activities to engage the students in the lessons, a circumstance clearly demonstrated in the teaching and learning approaches in the Implementation phase. Therefore it was evident that the lecturers recognised, reinforced and ensured that there were opportunities for the students to experience learning. They communicated with students in a way that created an environment conducive to learning. During the activities, the lecturers helped students to achieve success by closely monitoring the students and providing them with immediate feedback. Thus student assessment was interwoven with teaching and occurred through teacher observation of students at work. Above all, they modelled teaching and learning that the students could use later, when they enter the workplace. By using activity-based learning, they demonstrated ways to incorporate these strategies into lessons (for example – the coordinate games and practical experiment in the *Coordinate Geometry* and *Action of Heat on Nitrates* lesson respectively). The experience of the lecturers in the Primary Mathematics lesson and the diligence and commitment of the lecturer in the Chemistry lesson were demonstrably observable in their lessons.

However, the *A Happy School* lesson required a much more substantial activity and would have ensured deeper learning and not surface learning. Nevertheless it was observed that although the three lessons included activities, with the students played the main role in those activities, the lessons were highly structured and clear instructions provided in relation to the activities.

Interviews with both staff and students, indicated that they saw the role of the lecturers as:

- *Facilitators and* [that they wanted] *to develop learner-centred learners not only in pedagogy but sound in content also* (Pce.acs.int.24 May 2010).

The students validated these assertions when they described the lecturers

teaching style:

- *Motivate, explain with examples and provides us hands-on experience in the class for example in Science, we prepare a lot of things like pendulum and find out how oscillation works*; and
- *Makes us work in group, share ideas in groups, provide all possible ways to learn example – softcopy of handouts, hard copies (printed) in groups, helps us get information/data by directing us to websites, references and sometimes give us feedback during our presentations to make improvements* (Pce. Stu.int, 27 May 2010).

However comments from the interviews with students also revealed another side of the role of the lecturers. When asked *What did the lecturers mainly do in the class?* the response was:

- *Lecturing – Always for all the subjects* (Pce.stu.int, 27 May 2010).

They further indicated a desire for more learner-centred ways of learning:

- *Allow more independent learning – since they mostly lecture, they should allow us to learn independently and it should be progressive [sic];*
- *I feel that always lecturing is not very good, though some lecturers give group work/activities which are good;*
- *Provide learning activities;* and
- *Present effective Lectures with more content/examples* (Pce.stu.int, 27 May 2010).

These comments clearly drew attention to the fact that the lecturers used the *transmitter of knowledge* role more frequently than was observed by the researcher. In addition, students gave suggestions regarding ways in which they believed lecturers could be more effective in their roles, and supportive of students' learning:

- *We want lecturers to plan their lessons beforehand;*
- *Encourage me to learn independently, we are just given something to do and finally we submit. But there is no support and encouragement;*
- *Give more content – very necessary;* and

- *Present effective lectures with more content/examples - some lectures have well prepared lectures and gives lots of examples, always ready to brainstorm and answer your questions* (Pce.stu.int, 27 May 2010).

Such comments also suggest that the lessons observed did not represent the picture of teaching and learning approaches and the role of the lecturers in the colleges very accurately. There were comments which also made suggestions that the lecturers should plan their lesson more thoroughly, come prepared and provide proper instructions and guidance during sessions in which students engaged in independent work. By simply assigning students some work to do independently did not render the learning learner-centred. The students made a case for more effective lectures to be prepared, the desirability of support for them while they were engaged in undertake independent work, and the provision of greater content and examples. Many years of experience do not guarantee expert teaching. According to Adams and Pierce (1999) experience is useful only when the teacher continually engages in self-reflection and modifies classroom techniques to better serve the needs of the students.

The lecturers in the interviews also shared the following difficulties they faced teaching in the colleges:

- *Time constraint – heavy workload with 3-4 modules to teach per semester;* and
- *Vast content has to be taught which is exam oriented for electives* (Pce.aca.int, 24 May 2010).

These comments highlighted some of the concerns of the lecturers, and perhaps explained why they used 'lecturing'. With heavy teaching loads to contend with, delivering conventional 'lectures' may simply have been more convenient.

In conclusion, two different roles of the lecturers emerge. Based on the lesson observations, the lecturers had *written* lesson plans with the essential details, conducted activity-based lessons and monitored the students in an informal formative manner - all of which suggested that they were facilitators of student learning and practiced learner-centredness promoting some degree of active and deep learning. On the other hand, based on the student and staff interviews, the role of the teacher in the colleges

suggested that they were transmitters of knowledge, and not very sensitive to students' learning needs. These conflicting findings presented interesting perspectives on the role of the lecturers. As noted in the Methodology Chapter the participants selected for lesson observations were the 'cooperative' lecturers who volunteered as professionals to have their lessons observed. The three lecturers may be the ones who modelled learner-centred practices in the College (as evident from the student *In-Lesson Questionnaires*) whereas it may not be the prevalent practice amongst lecturers in the College (as evident from the interviews). Therefore, while it can be said that the role of some teachers in the College was that of facilitators, there were also lecturers who acted as transmitters of knowledge. Such inconsistencies are prevalent in colleges in other parts of the world too and not unique to Paro College of Education.

Role of Student

In the three lessons, there was not much evidence to suggest the direct role of students in the planning phase. The only example in which the role of students was considered was the *Teaching Primary Maths* 2 module plan, in which students were given a choice of assessment (Appendix 7.2). Apart from this single reference to taking account of students' choice, the role of students in planning was absent.

In the implementation phase, it was observed that three lecturers assumed roles as facilitators to varying degrees, resulting in the students necessarily taking a corresponding active role in their own learning. They were mostly active recipients as described by Kember (1999). The observation was made that in all three lessons the students were familiar with the procedures of group work and their roles as members of class groups. They were attentive, active and sincere in their learning during the pair/group tasks, and followed the procedures as instructed by the lecturers. Although they were not passive learners, their learning was directed and the classes highly structured. As seen in the *Coordinate Geometry* lesson it was such a fast- paced lesson involving several activities that were closely monitored by the lecturer, the students were restricted to following lecturer's instructions, leaving no time or opportunity for involvement in how they would take responsibility for that learning. The *Action of Heat on Nitrates* lesson too was tightly organised and closely monitored by the lecturer, so

students had no opportunity to accept responsibility for their learning. However, the situation in the *A Happy School* lesson was different. Although the lecturer organised group work, the lecturer's instructions were neither clear nor complete and therefore necessitated the students to take students to take greater responsibility for their learning. But this was not, however, an ideal way to have students accept responsibility for their learning.

It was observed that, students clearly wanted to be active, independent learners and also wanted more directions, support and encouragement in order to do so. As they were studying to become teachers, they were keen to learn both content and pedagogical principles so that they could acquire the knowledge and skills for later use in schools. In the students' interviews, there was an awareness of the challenges that lay ahead of them:

- *Challenging because many people complain about the quality of teachers and education itself. Nowadays it's competitive to be a teacher as we use skills. We come across different students and need to understand the ability of the students*
- *This course is challenging, as we have to deal with small children so we have to put ourselves in their shoes (Pce.stu.int, 27 May 2010).*

Some students were also critical of the group teaching and learning strategy used by the lecturers:

- *I prefer studying on our own as in group discussions, you don't get the proper support and cooperation from members, only 1 person is made to do all the work, so it is better to do individually. Besides, in group work, friends do not share information clearly,*
- *Regarding group work most of the time other members do not work and marks are given equally. Most of the time friends use us* (Pce.stu.int, 27 May 2010).

These comments indicate that group and perhaps other activities needed to be well organised so that there were appropriate learning benefits and responsibilities for all. If such strategies were not implemented effectively resulting in teaching that was not based on forethought and preparation, then students could develop negative attitudes

towards them.

Summary

Examination of data in this section has helped to evaluate the planning and implementation of the lessons and find out whether what was intended was achieved. By doing this, the research question *To what extent do the planning and implementation practices of the lecturers support student learning*? is addressed.

Based on the preceding analysis, it can be concluded that to a large extent, planning, implementation and evaluation practices supported student learning. This was mainly because what the lecturers had set out in the plans was achieved in the implementation thereby aligning the LOs with the teaching-learning and assessment in the lessons. Although there were LOs that did not appear in the lesson plans, but which were clearly part of the lesson implementation, most were beneficial and demonstrably positive impact on student learning was observed.

In the Implementation phase often the experience and commitment of the lecturers determined the manner in which lessons were delivered. For example, the lecturer who taught *Coordinate Geometry* was a very senior academic in the College and had many years of teaching, specialising on primary mathematics. The lecturer demonstrated effective planning practices as the lesson was well-organised and well-managed. It spoke of his experience and expertise in the area, as he did not have to make a great effort to engage the students in the lesson. Similarly in the *Action of Heat on Nitrates* lesson, the lecturer's sincerity and diligence in both the preparation and teaching were appreciated by the students and contributed to the success of the lesson. In the third lesson *A Happy School*, the lecturer demonstrated an informal and relaxed manner in the class which reflected his casual approach to planning and implementation of his lessons. The lesson plan was very brief, and instructions for the activity were unclear. However, this session provided students with the opportunity to take responsibility for their learning and resulted in good quality work by the end of the lesson. Perhaps his relaxed attitude did not inhibit the students and the loose structure of the lesson allowed students the freedom to be creative in their learning.

In conclusion, the role of the students was that of active recipients in the lessons.

Conclusion

The planning and implementation practices in the Paro College of Education positively supported student learning. When compared with the previous three Colleges - Sherubtse College, College of Natural Resources and College of Science and Technology, the lecturers in the College were trained teacher educators and had undergone teacher training, which was why they effortlessly taught using appropriate pedagogical skills

In this chapter, planning and implementation practices in Paro College of Education have been explored and attention drawn to the key findings regarding the type of the practices present. The findings indicate that there was both active and some deep learning taking place in the classrooms of the College. In the forthcoming chapter the Cross Case Analysis of findings of the pilot study (Appendix 3.9), and four case studies shall be presented.

Chapter Eight: Cross-case Analysis

Introduction

This Chapter draws on the evaluation of evidence from the pilot (Appendix 3.9) and subsequent four case studies in order to examine the *nature of teaching and learning practices in the Royal University of Bhutan.* A cross-case analytical framework is employed in order to examine, identify, and highlight patterns of similarities, differences and what was unique to individual colleges. The evaluation sections in the case studies, which focussed on the extent to which the planning implementation and evaluation supported student learning, forms the core of discussion in this chapter.

The similarities and differences across cases will be discussed as illustrations of particular phenomena occur in differing circumstances. Exploration of phenomena across cases can provide improved understanding (Bazeley, 2009). Throughout the discussion, links will be made to the available literature. Additionally, the cross-case analysis will provide further insights into the different histories, settings and purposes of the Colleges and show how the interplay of factors have impacted on the teaching and learning approaches in each College.

The pilot study (Appendix 3.9), as explained in Chapter Three qualifies to be included in the cross-case analysis as it contains sufficient quality and quantity of data and inclusion of it adds to the robustness of the analysis.

This analysis is organised around the same seven categories that guided the analyses of the planning, implementation and evaluation practices in the case studies, namely *Learning Outcomes, Teaching and Learning Approaches, Content Knowledge, Assessment, Resources used, Role of teacher and Role of student*. While patterns that emerged are considered here, discussion of conclusions and implications for teaching and learning practices are reserved for the final chapter of the dissertation.

Planning Practices in the Colleges

As discussed in Chapter Two, the fundamental role of lesson planning in teaching and learning practices is well-recognised in the literature (Kizlik, 2012). In the

case studies, the planning practices were diverse across the colleges.

Of the lecturers observed in this study, only those from the two Colleges of Education, a lecturer from Sherubtse and two lecturers from CNR had written lesson plans (N=14). The other 12 lecturers did not have written lesson plans (Table 8.1 in Appendix 8.1). However the latter group of lecturers were found to be cognisant of their planning role and ready to talk about the lessons during the pre-conference interviews. They referred to what they were to teach though they did not give a great deal of detail. As discussed in the literature on planning, these lessons were guided by mental constructs (Livingston and Borko, 1990) which experienced teachers have the capacity to react appropriately as they are able to 'think on their feet' (Maxwell & Kennelly, 2011). A mental map (McCutcheon, 1980) of the lesson, based on the lecturer's memory of past lessons, previous teaching experience and the success or otherwise of earlier lessons on the same topic may have been enough to allow the lecturer to decide if changes were needed, and therefore constituted an informal but appropriate lesson plan (Calderhead, 1984).

Although some lectures had considerable experience in their area of expertise, not all were experienced teachers: some had been teaching in the colleges for only two years. Thus the importance of a written plan, at least for the guidance of novice lecturers in their teaching, became evident. While a lesson plan does not have to be very detailed, it is clear that a written framework containing the essential elements of a lesson is crucial for successful teaching by inexperienced staff.

Observation of teaching practices performed for this research significantly suggests that absence of a written lesson plan does impact student learning. In lessons where lecturers did not have a written lesson plan they appeared not very adept at utilising skills and strategies to promote student learning, thus rendering a lesson superficial. The act of writing a lesson plan - a reflective activity – may engage the lecturer in thinking about the lesson content and therefore has implications for the teaching that follows. However since in three of the Colleges, lesson plans were rarely written, those inexperienced staff could be following the practices of the experienced lecturers and not writing plans for their own lessons, with potential negative effects. In

the two Colleges of Education written lesson plans were available and although they were not detailed they contained the critical components required implementing the lessons successfully.

The second issue that emerged was a failure of lecturers to recognise levels of planning indicated by their provision of module plans when they were asked for lesson plans. As explained in Chapter Two (pp 35-36) the criteria for planning at module level differs from lesson planning. Burden and Byrd (2010) have pointed to the significance of planning at the module and lesson levels. In the former planning involves major themes, theories, and ideas and entails numerous relevant topics to be covered over a longer period of time such as a semester. Planning at lesson level requires description of the course of instructions for an individual lesson, is more specific, and focuses on a topic to be covered within a specific and shorter time period, such as an hour.

Therefore of the lecturers observed in this study, only those with written lesson plans demonstrated good practices in this regard. These practices helped them to consider important elements and questions before the actual instruction began, and thus enhanced the probability of successful teaching and learning in their classrooms.

Learning Outcomes

In this study, LOs have been interpreted through the lens of the SMART criteria (Drucker, 1954; Doran, 1981) with the defining characteristics reflected in the definition of learning outcomes in the *Wheel of Academic Law* (Royal University of Bhutan, 2010b, p. 81). The LOs can form an integral part of 'student-centred learning' when the focus is on the learner and away from rather than the teacher. For consistency and analytical rigour, the following analysis of learning outcomes in in terms of planning and implementation used the same lens.

Planning

There were similarities and differences across cases with respect to the general framework and structure of the LOs. The similarities have resulted from the *Wheel's* mandate on framing LOs that were to be observable, specific, assessable and inclined to higher levels of thinking (Royal University of Bhutan, 2010b) and these are consistent

with the literature on this subject. Differences in writing LOs emerged due to the different nature and focus of study in the five Colleges as well as the varying levels of experience and competency among the lecturers in the Colleges. These are discussed below.

A significant similarity was the consistent practice of developing LOs for lessons in all the Colleges by lecturers, either in the written form or as oral communications (Table 8. 2 in Appendix 8.1). This is consistent with the mandate of the *Module Descriptor* in the *Wheel* that requires learning outcomes to be developed for all the modules offered in the Colleges (Royal University of Bhutan, 2010b, p. 81). The second observation was that 60 % of the LOs were in written form and these were mainly from the two Colleges of Education (PCE= 9 and SCE = 14). The College of Science and Technology was the only college that did not have any written LOs. Although data showed that Sherubtse College had four written LOs, they were all produced by the lecturer on deputation from one of the Colleges of Education. A large number of LOs (11) were communicated verbally by the regular lecturers of Sherubtse College. Written LOs were observed mainly in teacher education colleges and a few in CNR where some staff development programmes on teaching had been conducted (S. Trashi, personal communication, December 7, 2011) as 64% of CNR's LOs were in written form (Appendix 8.1).

The differences between colleges were in the types of LOs developed by the lecturers based on the SMART criteria - subject-specific or personal-generic. As noted by Adam (2004) in the literature, subject-specific LOs gives a subject its coherence and identity whereas personal-generic LOs relate to any and all disciplines and articulation of these LOs is important in enhancing the employability of graduates in all disciplines but dependent upon the extent to which each student engages in the learning experience and takes responsibility for his/her own learning (Eisner, 1979).

The LOs produced by lecturers in Sherubtse College with were strongly subject-specific, with negligible attention given to the creation of personal-generic LOs. In the other training or professional Colleges, such as the College of Natural Resources and the two Colleges of Education, the LOs were focussed on practical workplace skills and

the essential content of that discipline/profession. The one exception to this was by staff of the College of Science and Technology (training engineers). Their LOs had a greater content focus and lesser workplace focus. The LOs in the professional training Colleges identified detailed procedures and knowledge required by the students in order to perform the tasks necessary for that specific training programme. Examples of these LOs related to successfully treating wounds, the pinning and setting of insects in the College of Natural Resources, learning how to design mathematical games, and learning how to conduct chemistry practical experiments in Paro College of Education. This trait - subject-specific and personal-generic LOs - will be seen subsequently to have influenced the teaching and learning approaches and the learning environments in the classrooms of the Colleges.

Anderson and Krathwohl's revised version of Bloom's taxonomy (2001) was used as to tool to explore levels of thinking behind LOs and revealed variations throughout the case studies. The finding in Table 8.3 (Appendix 8.1) that 62% of the LOs were the result of lower levels of thinking is a matter for concern. The LOs produced by lecturers in CNR, CST and Sherubtse College indicate a higher concentration of lower levels of thinking while in the two Colleges of Education there is evidence of modestly higher levels of thinking (Table 8.3 in Appendix 8.1). Ray (2011) stated that while designing a course for an engineering degree programme, it is essential to select instructional objectives with major emphasis on higher levels of cognitive skills such as the ability to analyse and evaluate problems and create solutions implying the requirement of higher levels of thinking. While Ray refers specifically to engineering courses, these comments cut across the disciplines and could be applied in the context of the colleges of RUB as they offer degree courses. Biggs (1999, p. 58) stated that good teaching is getting students to use the higher cognitive level processes. Processes that focus on effective learning outcomes such as application and integration of the knowledge and skills acquired in a particular unit of instruction (e.g. activity, course programme etc.) and emerge from a process of reflection on the essential contents of a course. Consequently the LOs ought to be challenging and intellectually stimulating, rather than simply requiring that students regurgitate knowledge which

some of the LOs did.

LOs may, however, need to merely tap into lower levels of thinking at times, for example, when students are expected to achieve a basic level of knowledge or competency in the lesson. LOs for the first-year Computer Science lesson *Functions (Programming Fundamentals)* at Sherubtse College used action verbs such as 'describe' and 'write', indicating lower levels of thinking, as did the LOs for the *Coordinate Geometry* lesson at Paro College of Education. Hussey and Smith (2002) and Maher (2004) have argued that learning outcomes can be insensitive to the dissimilar requirements of different disciplines and this idea is applicable in this context. The concern, however, is the preponderance of lower level of thinking in the LOs.

The other contentious issue that emerged in this study is the language of LOs: the use of action verbs that were specific and the use of active language that make expectations clear (Adam, 2008). Use of such specific active language informs the students of standards by which they will be assessed and ensures that student and lecturer goals in the course are aligned (Table 8.4 in Appendix 8.1). Non-specific language, including such action words as *understand, see, study, give,* was used in 20% of the LOs across the Colleges, with the greatest share of it in Sherubtse College. Although the percentage is relatively small, research by Biggs (1999) found a great variation in the meaning of the term and Keane (2009) found the term used ambiguously. Hussey and Smith (2002, p. 225) argue that using precise language with specific action verbs can be delimiting for the students' learning experience and can be parasitic upon the very knowledge and understanding that they are supposed to be explicating; some of the LOs used in the professional colleges such as CST and CNR reflect this problem. Thus to make them applicable and useful, LOs need to specify knowledge, understanding, skills and abilities rather than simple behavioural responses, and to spell out the quality or standard required (Hussey & Smith, 2002, p. 225).

The practice of developing LOs was not seen consistently across all lessons (Tables 8.2, 8.3 and 8.4 in Appendix 8.1). While there were examples of fairly well designed LOs in the lessons across the five Colleges, there were also examples of LOs that were not well designed. In particular, in the two Colleges of Education all of the 23

LOs (PCE=9 LOs and SCE= 14 LOs) were developed reasonably well and appropriately realistic LOs; 52% of these included higher levels of thinking. Some good examples of LOs were also observed in CNR, especially in the written lesson plans.

The main principle of LOs, that they be student-centred, was absent in two LOs used in the History lesson at Sherubtse College. Instead the LOs were focused on the teacher and were expressed in terms of teacher's intentions of what would be done with the students in the lesson rather than *what the students would do* as a result of learning in the lesson. Moreover they were dedicated to providing moral lessons to students which were aspirational notions and not realistically achievable in the lesson. Poorly constructed, narrow, and limited learning outcomes are not appropriate for higher education where creativity and imaginative leaps are highly valued (Adam, 2008, p. 17).

As noted earlier, LOs from the two Colleges of Education were found to be the best developed among the five case studies in this research. This might be expected. They were far better aligned with the teaching and learning approaches and assessment strategies and therefore congruent.

The precision of the strict criteria found in training curriculum that is focused on a particular topic (in this case teacher-training) may lead to better designed LOs. According to the Bologna process (Adam, 2004) the use of LOs have been advocated and implemented across disciplines (such as engineering, medical, teacher education in European universities. Adam (2004) asserts that LOs provide a common currency between vocational education and training, and higher education, thereby helping to promote lifelong learning.

Implementation

There were similarities and differences across cases in relation to the implementation of LOs during the lessons. In addition to the implementation of LOs described in the plans all lessons included the occurrence of 'unplanned/unintended' LOs. These could be seen in interaction between students, teachers, and the subject during the implementation of the lessons. 'Unplanned' LOs allude to the notion of the 'hidden curriculum' which is understood as knowledge, skills and values that are

constructed on matters that have not been in the lesson design (refer to Literature Chapter). These unplanned LOs were student centred as they can have a positive influence in the lessons, as discussed in the case studies on learning outcomes in the Implementation Phase. As most of the unplanned LOs complemented and enhanced student learning, their inclusion supports effective practice. Examples of unplanned LOs were seen in all the colleges. They were personal-generic LOs where the lecturers modelled good practice for students to learn and carry over to the schools, promoted scientific values, showed sensitivity to cultural/religious values, placed greater responsibility on the students for their learning and created conducive learning environments.

Negative examples of 'unplanned' LOs occurred with the total absorption of lecturers in their teaching or the casual attitude of the lecturer that they failed to motivate students to learn. Inadvertently they reinforced certain kinds of behaviour among the students who were overlooked in the lesson.

Analysis revealed that while there were similarities in that all the Colleges had LOs for their lessons, there were differences present among them across the Colleges in the types and nature of LOs. The exercise of developing LOs is seen as a significant shift towards student-centred practices.

Teaching and Learning Approaches

The discussion in the following section will compare and highlight the significant findings from the case studies for teaching and learning approaches observed in the planning and implementation phases.

Planning

As all the Colleges were subject to the academic guidelines endorsed in the *Wheel* (Royal University of Bhutan, 2006b; 2008 ; 2010) which clearly mandated a student-centred approach with active and deep learning at the forefront, however the engagement with these directives has been slow. Although the university does not explicitly compel the Colleges to apply them, the underlying philosophy of teaching and learning in RUB necessitates the use of more student-centred approaches as the only

logical progression. The discussions in Chapter 2 on teaching and learning in higher education showcase the rich benefits of adopting/shifting to more student-centred and deep approaches to teaching and learning.

A significant observation was that in three case studies it was evident that 'lecture' was the most commonly planned teaching and learning approach. There were, however variations in the way 'lecture' was planned and presented as some lesson plans had a conventional lecture approach as seen in the *Jainism*, and *Government Budgeting* lessons in Sherubtse College. Whereas at the other end, moderately interactive lectures were also planned with questions, demonstrations, problem-solving and class discussions in the *The Way of the World*, and *Social Interactions in Everyday lives* lessons in Sherubtse College, the three lessons in CST and four lessons in CNR. In Sherubtse College while all the lessons had lectures planned as the teaching and learning approach, the *Pollen Germination* lesson by default was a science practical lesson and the only lesson in the college that had not planned to use 'lecture' as the principal mode of teaching.

In contrast, in the two Colleges of Education a range of teaching and learning approaches such as group activities (as seen in the three lessons in PCE and the *Communication Approach, The relation between Education and Development, Concept mapping, Project Method* lessons in SCE) and individual activities in the *Individual Differences* and *Pronunciation using consonants* in SCE were planned in order to engage the students. The approaches were selected and matched with the lessons, suggesting the expertise and competence of the lecturers in terms of planning. Literature about student-centred teaching and learning in higher education is clear, with a significant pedagogic shift towards teachers providing support, guidance and facilitation by offering ideas, suggestions or help (Lea, Stephenson, & Troy, 2003). The prominence of these mediating strategies was associated with the teacher "taking more of a back seat and being the facilitator" than as transmitter of knowledge. The findings revealed that the planning of teaching by these lecturers was as stated by Weimer (2002) the creation of lesson plans focussing on student learning, and not on what the teacher will do with the idea to facilitate learning. Further, according to Knapper

(2008) the greatest responsibility of the teacher is not the communication of subject-matter content, but the selection and design of appropriate learning tasks. Only on this basis, can the majority of the students have significant learning experiences.

Implementation

Observation of the implementation revealed that the teaching and learning approaches could be looked at along a continuum. The conventional lecture, which was teacher-centred and typically led to surface learning, was at one extreme. Lectures with activities embedded in them, thus invoking some kind of deep and active learning, sat midway along the continuum. At the other end of the continuum, student-centred practices that promoted comparatively higher levels of active and deep learning were situated.

'Lecture' was the most widely-used strategy, being used in three case studies. The two Colleges of Education that had a comparatively extensive repertoire of teaching and learning such as group discussions, individual activity, and group presentations that actively engaged the students with the learning tasks although students reported that lecturing was evident in Paro College of Education. The blend of a range of teaching and learning approaches, with 'lectures' playing a minor role, implied that many lecturers implemented active and deep learning to a considerable degree.

However as mentioned above in the Planning section, not all of the 'lectures' could have been described as 'conventional'. Several interactive strategies, using questions and answers, class discussions, demonstrations, guided practice, embedded activities in the lessons with the intention of fostering active student engagement with the learning tasks and enhancement of the value of the lecture segments were evident in the case studies.

Three examples of interactive lectures were observed. The first involved interactive lectures with Q&As, and was the most commonly utilised. The interactive lecture with both Q&As and class discussions (Sociology lesson in Sherubtse College) was one of the best demonstrations of an interactive. Interaction with the materials and

content of the lesson was seen in lessons in the Colleges of Natural Resources, the College of Science and Technology and Sherubtse College. However because pedagogical aspects were not closely attended in these interactive lectures, the effectiveness of using them to their maximum potential could not be exploited. For example, during the guided practice of mathematical calculations for trigonometric theta and seismic analysis or computer programme procedures, opportunities were not provided for students to share their findings. Instead, lecturers provided the solutions, thus depriving students of what could have been intellectually challenging and stimulating activities. Provision of the 'answers' indirectly encouraged some students to wait for the lecturers to solve the problems and then simply copy them, thus reinforcing passive learning.

Nevertheless, these modest attempts at interactive lectures did, to a certain extent, engage and involve students as active participants in a lecture-based class rather than as passive recipients of learning. It must not be assumed that because students responding to low levels of questions or are working in small groups that they are totally teacher-directed, students are engaged in some kind of active learning. Instead, teachers are challenged to provide students with opportunities to discuss problems with others in-depth and in ways that illuminate key points. Data from the Colleges indicated that elevating learning to higher levels rather than encouraging mere regurgitation of facts and figures are challenges RUB lecturers face. Some fairly commendable examples of higher order learning were seen across the lessons such as *The Way of the World* lesson (Sherubtse College), the *Communication Approach* lesson (Samtse College of Education), the *Action of heat on Nitrates* lesson (Paro College of Education), the *Soil Water* lesson (College of Natural Resources), and the *Linear Control Robotics* lesson (College of Science and Technology). These lessons demonstrated various degrees of understanding of the subject matter, and allowed students to experience the dilemmas presented by the content through providing opportunities to deliberate in ways that enhanced deep learning.

A further issue that emerged during observation of lectures was the way that lecturers made brave efforts to make the lessons interactive, even in challenging

learning environments such as large student numbers. The *Soil Water* lesson in the College of Natural Resources was exemplary in encouraging students to take responsibility for their learning in a particularly unfavourable learning environment. Another outstanding example occurred in the *Social interactions in everyday life* lesson, in which the lecturer created a very stimulating and enjoyable learning environment through the balanced use of Q&As, relevant examples of the concepts and humour, to motivate the students. These two examples showed that interaction in even large classes was possible contrary to some lecturers' opinions.

The use of learning activities in lessons, as such, was seen only in the two Colleges of Education. The students were involved with activities that promoted comparatively deeper levels of engagement than lecture-based lessons. Students engaged in active, deep learning are not passively taking information from instructors but are reading, writing, discussing and problem-solving. The challenge to the lecturers organising such activities was in presenting them and content that were educationally seamless. This is an important point, as the customary thinking about using activities was that they are add-ons and not a part of the lesson (example the comment in the informal conservation in Sherubtse College about using lectures). The lecturers in the two Colleges of Education in whose lessons activities were evident succeeded in making student activities and content in the lessons seamless by combining content and pedagogical principles.

The activities required that students think about what they were doing (content) with how they were doing it (process) that resulted in meaningful learning. The Dzongkha lesson on *Pronunciation using Consonants* in Samtse College of Education deserves special mention. It was an exceptional student-centred lesson in which the lecturer engaged the class using both individual and whole-class activities with high levels of engagement. It was, by far, the most learner-centred lesson among the eight lessons observed in Samtse College of Education, and challenged Phuntsho's observation that teaching Dzongkha is generally traditional and teacher-centred (2000). Although the activity was simple, with students reading aloud and repeating words until they were correct, it was appropriate for language learning.

'Direct instruction' (Cavanagh, 2004; Swanson, 2001) was present, at least partially in the College of Science and Technology classes. In 'direct instruction', teachers follow a sequence of events, generally stating the objective, reviewing skills necessary for new information, presenting new information, questioning students, providing group instruction and independent practice, assessing performance, and giving more practice (Cavanagh, 2004; Swanson, 2001). Independent practice was not observed, but was replaced by guided practice in which the lecturers mostly solved the problems together with the students, rather than allowing them to do it on their own. Direct instruction is a teacher-centred instructional approach that is most effective for teaching basic or isolated skills (Kroesbergen & Van Luit, 2003). In the case of CST's lessons perhaps this was appropriate to the learning context.

Findings from the case studies have confirmed that lecturers using pedagogical content knowledge intuitively drew on and were able to utilise many aspects of teaching and learning in the classrooms based on the principles of active teaching and learning. While this was the core of the teaching and learning principles in the two Colleges of Education, it, however, was not given priority over content knowledge in the other three of the case studies. Obviously, teachers must know something about the content they teach. The interconnectedness of content and pedagogy play an important role in effective teaching (Shulman, 1986 ; Gess-Newsome & Lederman, 1999) and both are crucial and that an emphasis placed on content dimensions of teacher knowledge should not denigrate the importance of pedagogical understanding and skill: **'***Mere content knowledge is likely to be as useless pedagogically as content-free skill***'** (Shulman, 1986, p. 8). PCK was largely missing, other than in the two Colleges of Education. The lecturers in these two Colleges combined knowledge of a specific discipline with teaching of that discipline appropriately, which led to effective learning for students. Evidently this link was not well-established in the minds of all lecturers which resulted in these lecturers using the 'lecture' as the primary teaching and learning approach. As they said it was easily accessible and required relatively less planning and organisation for large classes.

In summary the teaching and learning approaches considered along a continuum

with conventional 'lecture' which was teacher-centred and typically lead to surface learning at one extreme, 'lectures' embedded with activities that invoked some deep and active learning midway, and lectures that were student-centred and thus promoted comparatively higher levels of active and deep learning, at the other end of the continuum. From the findings, the importance of pedagogical content knowledge was perceived as a requirement in promoting student learning.

Content Knowledge

Without professional expertise in all content areas, assessment of the content knowledge of each lecturer involved in the study would not have been feasible. Therefore the cross-case analysis is made with respect to what was observed in the planning and implementation of content knowledge in the lessons.

Planning

The assumption was made that the content knowledge which was used as a foundation for the lessons in the three colleges was relevant and adequate, because each was based on the Module Descriptors which had been developed by the lecturers and undergone stringent processes of external validation by subject experts (Royal University of Bhutan, 2010a). Consequently as the content knowledge was measured against the module plans which contained complete information and provided guidelines and a sense of idea of what to expect in the lessons, it can be stated that essentially across the five cases, the depth and breadth of content knowledge planned in the lessons were adequate. It is significant that although lesson content was closely guided by the module plans, in individual lessons it was left to the lecturers to decide. Given that the time provided was one hour (for majority of the lessons), however, lecturers needed to make judgements about what was important and how much students could be expected to cover in a lesson.

Given my extensive background in education, it is appropriate for me to comment particularly on lessons given by lecturers in the two Colleges of Education. The findings indicated that the content knowledge in the *A Happy School* lesson (Paro College of Education), the *Stem and Leaf Display* mathematics lesson, and the *Project*

work in Social Studies lesson plans (Samtse College of Education) did not meet what might what could be considered appropriate preparation for classes taught at tertiary level. They lacked depth and made little demand on students.

A notable difference among the case studies was that the content knowledge in the written plans was explicitly stated in some detail in the eight lesson plans in Samtse College, three plans in Paro College of Education, two plans in CNR and one plan in Sherubtse College. On the other hand, in the oral plans in seven lesson plans in Sherubtse College, three in the College of Science and Technology and two in the College of Natural Resources, content knowledge was merely mentioned by the lecturers as lesson topics, but details were not provided.

Implementation

During implementation of the content knowledge in the lessons it was observed that those of Sherubste College, the College of Science and Technology and the College of Natural Resources were dense with content knowledge. In fact, the *Wound Treatment* lesson in the College of Natural Resources had as many as 12 subtopics taught in the lesson which spanned 90 minutes. This was quite a lot of content. Too much content without analysis and reflection could lead to surface learning. As argued by Beaudry (2000) if the content is too great, students may remember minute unimportant details instead of remembering the most important concepts in a lesson, and it would be better for students to learn less, remember it, and be able to apply what they learned later. Further McCombs (1992) declares that more content does not necessarily mean more learning and it does not promote active learning, as more content would perhaps mean more memorisation and therefore the lesson would not be student centred.

On the other hand, in the two Colleges of Education the content knowledge was relatively well paced during the stipulated time, with the exception of the three lessons mentioned earlier (*A Happy School* lesson in PCE and *Stem and Leaf Display and Project Method* lessons in SCE) in which the content knowledge in lessons was not as stimulating, and although adequate for the one- hour duration the presentation of content was not well thought out.

As discussed in the Literature Chapter regarding amount of content to be covered, brings to the fore the most contentious conflict in education, the debate on depth vs. breadth (Schwartz et al., 2008). It is not just more content but the right content which develop deep understanding and thus to deep learning. Therefore according to Paek et al. (2005) teachers who strike an appropriate balance between depth and breadth of content coverage would be more effective in facilitating successful performance of the students.

In four of the Colleges (CST, CNR and the two Colleges of Education) in which the programmes were designed for professional training, contextual teaching and learning was evident as they awarded professional courses in teacher training, agriculture and engineering. This is relevant as basing the curriculum on contextual teaching relates subject matter content to real world situations and motivates students to make connections between knowledge and its applications to their lives as family members, citizens, and workers (Berns & Erickson, 2001).

Relevance of content in Sherubtse College was focussed on a general degree and provided a wider base of content knowledge and were not preparation directed. However, as evident from the data, some of the relevance of the College's lessons could be questioned such as the Botany practical exercise on *Pollen Germination* using the hang drop method. The students themselves have questioned the relevancy of the content of practical exercise and its usefulness in the Bhutanese context. The other example is of the content of '*Government Budgeting with reference to India'* lesson, which appeared to be geared towards understanding the lesson in context of India. This too has come under the students' review and they commented on the usefulness of the content in the Bhutanese context.

In the case studies, the students reasonably gained new knowledge and skills in attending the lessons that were useful to the workplace as in the professional training colleges and as general education for the students in Sherubtse College.

Assessment

Mode of assessment can have a powerful influence on the learning behaviour of

students (Biggs, 2003; Ramsden, 2003) and assessing the performance of students is one of the most important activities educators undertake (Price et al., 2011). It is significant that students at the tertiary level are already assessing their own work and generating their own feedback and that higher education should build on this ability (Nicol & Macfarlane−Dick 2006).

Planning

During the planning phase, assessment such as evaluating prior learning and summarising the lesson was prepared. As expected, written plans in the two Colleges of Education, two lesson plans in College of Natural Resources and one lesson plan in Sherubtse College had these assessment strategies listed. On the other hand, the lecturers did not mention assessment as an important aspect of their plans in the remaining 12 plans, which were orally communicated,

Implementation

The most common form of assessment recorded during the implementation stage, across all the Colleges studied was 'informal formative assessment'. According to Wragg (2001) this might include observation, monitoring, questioning, and feedback. The forms used in the Colleges were mostly questioning to check understanding, and a few instances of monitoring and feedback. Assessment of this kind has the potential to directly improve learning because it takes place while instruction is in progress and can serve as the basis for providing timely feedback for increase student learning (Sadler, 1989; Shepard, 2005) which was observed in a few instances such as the Sociology, English lessons in Sherubtse College, Soil Water lesson in CNR and in most of the lessons of the Colleges of Education.

Regarding the types of questions asked during the informal formative assessment, most lecturers merely asked the student to recall verbatim or in his/her own words, material previously read or taught by the lecturer. Lower cognitive questions are also referred to in the literature as fact, closed, direct, recall, and knowledge questions (Cotton, 2001). She expalins that these kinds of questions are more effective when the teacher's purpose is to impart factual knowledge and to assist students in committing

this knowledge to memory. In the case studies they were employed in lessons in which the aim was to check whether students had understood what was explained. There were few examples which included questions requiring higher levels of thinking, such as those which would engage the students to mentally manipulate bits of information previously learned in order to create an answer or to support an answer with logically reasoned evidence (e.g. the *Soil Water* lesson in CNR, *Social Interactions in everyday life* lesson in Sherubtse College). The questions asked were also either convergent or divergent. In lessons in which convergent questions were asked, only single answers were required, and further responses or opportunities for discussion did not occur (e.g. *Chainsaw tasks and techniques* lesson in CNR). Divergent questions valued a range of responses, based on informed opinions and analysis, and encouraged more participation and discussion. Examples of these were seen in the Sociology lesson *Social interactions in everyday life* at Sherubtse College and some lessons in the Colleges of Education. The Sociology lesson provided one of the best examples among the case studies, because the questions in the lesson allowed for divergent responses and opinions from students, which made them think. As said by Angelo and Cross (1993) that use of questions in informally assessing the students would allow the lecturers to know more about what the students think and how they learn, and therefore plan their lessons accordingly.

Besides questioning, monitoring as an example of informal formative assessment was exemplary in the Chemistry practical lesson on *Action of heat on Nitrites* at the Paro College of Education. The lecturer was meticulous in his/her monitoring and ensured that all the students were on task, guided them by asking questions and facilitated learning in the class. The other lesson in which monitoring was seen was a similar type, a Botany practical lesson in Sherubtse College which was not presented as meticulously as the Paro example.

Assessing students' prior learning at the beginning of the lesson is another example of informal formative assessment that was observed. Lecturers who used this form of assessment implemented it by asking questions to recap previous content and establish links with the lesson topic or as seen in two lessons in Sherubtse College (e.g.

The Way of the World and *Government Budgeting with reference to India* lessons in Sherubtse College). These lecturers spent a great deal of the lesson recapping previous topic learnt and clarifying the concepts, establishing links before embarking on the lesson topic.

In some lessons across the Colleges, the lecturers did not assess prior learning in the lessons. A large body of findings shows that learning proceeds primarily from prior knowledge, and only secondarily from the materials presented (e.g. Roschelle, 1995). Learners are more likely to construct an interpretation that fits in with prior knowledge. Thus, the effects of prior knowledge require a change from the view that learning is absorption of transmitted knowledge, to the view that learning is conceptual change (Resnick, 1983; Champagne, Gunstone, & Klopfer, 1985 as cited in Roschelle, 1995). With such positive benefits associated with prior learning, it would be advantageous for lecturers to pay it more attention, and incorporate it into their lessons.

Illustrations of informal formative assessment carried out in the Colleges raise several issues. Although there were a few instances where it was done quite effectively, this was one component which was generally underused in the Colleges. For example, lecturers did not really use student responses to guide their subsequent teaching such as seen in the *High Voltage Generation* lesson in CST, and *Functions (Programming Fundamentals)* lesson in Sherubtse College. In lessons such as the *Soil Water* lesson (CNR) and the *Social interactions in everyday life* lesson (Sherubtse College) the lecturers did use the responses of the students to guide them in their subsequent teaching, and as prompts for further questions or to cite more examples but these were the exceptions.

For formative assessment to be truly effective, lecturers need to identify and respond to students learning needs (Observer OECD, 2005). In most of the lessons across the Colleges (except the Colleges of Education), the learning needs of the students were not attended to, as lecturers were either engrossed in their teaching (transmitting information) or were not cognisant of the learning needs of the students.

Effective assessment is inseparable from good teaching and learning and

therefore should be aligned with the learning outcomes and activities of the lesson (Biggs, 2003; Cotton, 2001). Alignment was well established in the Colleges of Education, with a few exceptions (such as the *Stem and Leaf Display* lesson on Descriptive Statistics in Samtse College of Education) because different activities were used in the lessons aligning the LOs with informal formative assessment. In the other Colleges the teaching and learning approach was mainly 'lecture' with focus on content knowledge in alignment was often overlooked. Assessment tasks mirror the LOs, because as far as the students are concerned, the assessment *is* the curriculum (Ramsden, 2003).

There are interpretations, which may explain why formative assessment, including classroom assessments, is not so well used in Bhutan. One may be model of teaching and learning which tends to focus on teaching by transmission and in which lectures are delivered with little time for lecturers to check student understanding, adjust their teaching accordingly, or encourage interaction, questions or digestion of new concepts and ideas (Celtic Regional and Minority Language Abroad Project, 2006). Informal formative assessment seldom takes place in such a scenario, as the lecturers are busy with the content coverage. A typical example of this was observed in most of the lessons in Sherubtse College where the lecturers were intent on 'covering the curriculum' rather than promoting deep, active learning. An additional explanation could be that RUB programmes have been modularised and semesterised and student numbers have increased over the years as Gibbs and Simpson (2007 pointed out in UK.

Further summative assessment are clearly set out in the module plans of the colleges with examinations occupying a major portion of the assessment strategies in the plans. This suggests the importance assigned to summative assessment in the colleges.

Analysis of the data indicates that there is a good deal of work to be done in order for lecturers to change the way they carry out classroom assessment, interact with students, set up learning situations and guide students toward learning outcomes, and even how they define student success. Information that lecturers obtain from classroom assessment activities can be useful for improving teaching and learning in a variety of

ways. In summary, assessment was not one of the strengths in the case studies and as mentioned earlier work needs to be done to strengthen it in order to promote student learning.

Resources

The need for more learning resource materials is implicit in many developments in education (Harden & Crosby, 2000). More and better resources enhance the learning atmosphere in the lessons as they can be used to help reinforce new information or skills. With student-centred, active and deep learning approaches, students are dependent on having appropriate resource material available for use either as individuals or in groups. Harden and Crosby (2000) observed that even in traditional curricula, students spend as much time with their textbooks as with their teacher although now a similar case could be made for Internet resources.

Planning

A reasonable variety of resources/teaching aids was planned for use in the lessons across the Colleges. These ranged from PowerPoint presentations, chalkboard, CAD software, Manuals on seismic engineering, the *Way of the World* textbooks, laboratory apparatus and materials, mathematical games' materials, activity sheets, multimedia such as video clips, insect boxes, objects such as a chainsaw and were engaged at differing levels in the lessons.

Observations indicated that planning of resources to be used in the lessons was well organised in the Samtse College of Education, with both variety and relevance of resources for the lessons taken into account. Examples such as the activity sheets, mathematical games, laboratory apparatus and materials, handouts, Kuensel (National newspaper), video clips demonstrating measurement of Body Mass Index, and OHT were listed in the plans and linked to activities for which they would be used. Interestingly in the other College of Education, Paro resources were planned for only in the *Coordinate Geometry* lesson.

Resources were also well-organised and appropriate for the lessons in the College of Natural Resources; they were both subject-specific and general, such as

those for use in treating wounds in animals, for collecting insects, chainsaw and PowerPoint presentations containing diagrams, photos, graphs, textual as well numerical information were prepared for the lessons.

On the other hand, most of the lessons in Sherubtse College and two in CST did not mention resources apart from the textbook in the *Way of the World* English lesson, the science laboratory in the *Pollen Germination* lesson and Manuals and software on seismic engineering in the Seismic Engineering lesson.

Implementation

The best examples of resource utilisation amongst the case studies were again observed in the Colleges of Education (although in the planning phase two of the three lessons of Paro College of Education had not mentioned resources), where mathematical games, activity sheets, video clips, PowerPoint presentations, overhead transparencies, the science laboratory apparatus and materials were used in the lessons. The resources were designed to help illustrate ideas/concepts and reinforce learning, as teaching aids to augment the learning experiences of the students. .

In the College of Natural Resources, all four lessons included PowerPoint presentations as the classrooms were well-equipped with computers and LCDs to project them. This was a sticking point in Colleges such as Sherubtse that had insufficient resources so even though most lecturers wanted to use PowerPoint presentations for their lessons they were not able to do so. Insufficient resources impacted heavily on the lessons because lecturers decided to resort to 'lectures' as there were not sufficient LCD projectors for use in the department, a matter raised by the Sociology lecturer in Sherubtse College.

The PowerPoint presentations in the CNR were well-developed and included relevant content, graphs, pictures, diagrams and links to video clips/films - all evidence of the substantial work put into preparing them. While most of the lecturers used PowerPoint for transmitting information, in the '*Soil Water'* lesson it was used in a much more interactive way. Their use is consistent with international practice where traditional lectures in higher education are increasingly being delivered using

presentation software such as Microsoft PowerPoint (Nicholson, 2002).

Literature on the use of presentation software states that the potential pedagogical value and rationale for using classroom PowerPoint raises interest level, enhances understanding and keeps the students focussed (Ludwig et al., 2004, p. 3). Examples of using multimedia were seen in the Samtse College of Education for the Health and Physical Education lesson, and in the *Wound Treatment* lesson at the College of Natural Resources. While the PowerPoint presentations were practically applied in the latter lesson, in the former the expected value did not eventuate as expected.

Conversely, although PowerPoint presentations have enormous benefits, there are several possible pitfalls when they are used without adequate forethought and careful planning. The *Government Budgeting with reference to India lesson* in Sherubtse provided an example of an ineffective use of PowerPoint because it was content intensive and did not allow for interaction and engagement of students. Further, since there is an unspoken rule associated with PowerPoint for questions to be asked at the end of the presentation, students will get into the knowledge receptor mode and therefore become passive in the class, as there would be little active engagement during the presentation. This may occur happen as sometimes the teacher will do little more than read the slides out loud, adding a few extra adjectives and anecdotes as happened in the *Government Budgeting with reference to India* lesson in Sherubtse College. Used in this manner, PowerPoint is *actually* the conventional lecture in a different form. PowerPoint presentations need to be utilised with care and plan activities within and around the slides to obtain the maximum benefits.

While PowerPoint was a popular lecturer choice as a teaching resource, chalk/white board was the other resource frequently used in the Colleges. Use of chalkboards conferred the ability to change the information at will and gave the ability to communicate pieces of information to students over a short period of time and even respond to issues coming from the class. Exemplary uses of the chalk/white board were seen in the Mathematics lesson *Application of Trigonometric Theta* (Sherubtse College) and in the *Linear Control Robotics* lesson (CST). The board work for these lessons was

neatly written in a well-sequenced and logically-developed way making it easier for students to understand and make notes for future reference. It may be relevant that both the lessons had scientific orientations, and perhaps the outcome is the process of the thinking in these subjects. Moreover, the strategic use of the white/chalkboard in conjunction with PowerPoint by two lecturers from CST and Sherubtse College demonstrated an ingenious way of tapping into the benefits of both types of resources to enhance their teaching. They used the chalk/whiteboard to demonstrate examples of mathematical calculations/procedures while the PowerPoint was used to disseminate the information thus showing some ingenuity, which enriched the lessons' presentation and was different from the conventional mode of usage.

Although textbooks were not commonly used resources in lessons in most of the Colleges, there were evidences of its use in some lessons. For example, textbooks in Sherubtse College were used extensively in the English lesson *The Way of the World* (Sherubtse College) with the lecturer directing the lesson's discussion on the theme, characters, and plot of the play. It was good practice as the students could follow the line of discussion. Students required something specific to read and comprehend in this lesson, as they were not familiar with the cultural context of the play. Additionally manuals were used extensively in lessons in the College of Science and Technology to analyse seismic force on building structures.

Textbooks are excellent teaching aids and can facilitate learning for the students providing structure for lessons and quality if the textbook is well developed and based on sound learning principles and are paced appropriately (Fredericks, 2005). The absence of textbooks in the other lessons suggested that textbooks might not be frequently used in the Colleges as the lecturers based their lessons on several reference books. However, data on library resources in the Colleges, indicates clearly that the supply of reference books is not adequate - a matter that is of primary concern. If quality learning is to be promoted in the Colleges' classrooms, one of the key requirements is to have adequate resources for learning made available to the students.

Other resources were also used. These included the newspaper *Kuensel*, were used effectively, for example by the lecturer who taught *Pronunciation using*

consonants in the Dzongkha lesson (Samtse College of Education). Its use in that setting was a creative idea, using readily-available material which was used for the main lesson activity thereby relating it to the students' everyday lives and learning. Lecturers in two Colleges used the Chemistry and Botany laboratories which were adequately stocked with apparatus and materials for experiments efficiently leading to the successful conduct of the practical experiments. Additionally the presence of laboratory assistants was an added asset to the practical work.

Use of other resources such as the mathematical games in the Paro College of Education and the activity sheets for the *Communication Approach* lesson at Samtse College of Education contributed to enrichment of the learning experiences of the students. Sets of resources such as the grid sheets, coordinate grids, activity/worksheets and the dice game were adopted from primary Mathematics and English language resources and adapted for the classroom situations. In this study, there were use of a real object (e.g. chainsaw) and model (e.g. insect box) in the College of Natural Resources and used it with a specific purpose. Using these resources made the lessons enjoyable, exciting and interesting and provided opportunities for students to be actively involved in learning.

It is significant that technology was mentioned as a resource for teaching and learning in the Colleges. Although they were not explicit in the lessons observed besides the PowerPoint, simple functions of programming and Computer Aided Design (CAD) software references were made to them in the College programme documents such as Web 2.0 in Paro College of Education, Moodle in Samtse College of Education, and Content Management System in the College of Natural Resources. While it was not clear how Web 2.0 was used in PCE, Moodle was mainly used for distance education in SCE, the Content Management System (CMS) in CNR was actually referred to in one of the lessons where lecturers asked the students whether they had accessed the handouts on *Insect Collection* from the CMS prior to the lesson. This suggested that the CMS was utilised by at least one lecturer to provide handouts about the lessons they would teach so that students could access them before the lesson. Since this technology was introduced as recently as 2009, and may still require some time for it to become

established as a learning support resource. Besides these open sources and platforms for learning, software programmes such as CAD software was also used in the *Seismic Engineering* lesson (College of Science and Technology) for demonstrating calculations of seismic forces on building structures. This software was used successfully by the lecturer. Resources in this category have great potential to be explored further and subsequently utilised in classrooms to enhance learning. They have captured the interest of educators and have become increasingly popular for the associated benefits (Ran, 2003 as cited in Kinley, 2009) and the wealth of information about unlimited topics (Ackland, Spink & Bailey, 2007 as cited in Kinley, 2009) they bring into university classrooms. RUB has initiated Virtual Learning Environments in the Colleges and urge lecturers to utilise the online educational platform for both online and face-to-face teaching and learning (Royal University of Bhutan, 2011a). Nevertheless the use of these technologies was modest.

Although resources can contribute greatly to teaching and learning, it is important to note that it is ultimately the lecturers themselves who are an important resource. As curriculum planners, implementers and assessors, lecturers have the greatest impact on students and their learning. They also organise resources and make available additional information and teaching/learning aids for students. Their understanding and knowledge of the curriculum is fundamental to their teaching. Lecturers in the case studies demonstrated adequate knowledge and understanding of their subjects and were able to deliver it competently to the students. At times, students were dependent on the lecturers for content knowledge (see, for example, CST, *Linear Control Robotics* lesson, page 232). Equally important is the lecturers' conceptual understanding of their role as a teacher, and in the study, examples of their ability to influence the direction of a lesson, and their ability to make or break a lesson were observed. Their professional attitude and behaviour were critical factors in promoting learning. One specific case in which the warm, concerned and amicable nature of the lecturer made a difference to the learning environment (Sociology lesson on *Social interactions in everyday life* in Sherubtse College, was an exemplary example, page 123), contrasted with others at Sherubtse in which the lecturers were distant and mainly

engrossed in their teaching, greatly influenced students' adoption of the role of passive learners.

In summary, there was a combination of resources present in the lessons including the ubiquitous chalkboard, PowerPoint presentations and activity/worksheets all of which enhanced learning in their own ways. Although the resources used were fairly adequate throughout the Colleges, the College of Natural Resources presented a particularly resource-rich environment, as it was well equipped to provide efficient support for its programmes.

The Role of teacher

Teaching is a demanding and complex task (Harden & Crosby, 2000). The roles of the lecturers across the Colleges included roles as curriculum planners, implementers and resource organisers. Not all the lecturers, however, were curriculum developers as other lecturers in the subject department had written the modules on which the lessons were based (S. Wangmo, personal communication, 13 September 2010).

Planning

In the planning phase of the lessons, the lecturers were mainly seen as curriculum planners and resource organisers. As curriculum planners they prepared lessons, either in written form or as mental constructs. In the five case studies, the lecturers were explicitly seen as the decisive influence in planning the lessons. They acted as decision makers in determining the learning outcomes, content, assessment and resources to be used in the lessons. Written Module plans, largely guided their lesson plans. Apart from lecturers in the two Colleges of Education, two in CNR and one in Sherubtse College, most of the lecturers were not very clear about the different levels of planning. This indicated that some of the lecturers were not very clear about their role as lesson planners. Although it is conceded that the module plans to a large extent guided the lesson plans, they are two *different kinds* of planning.

As resource organisers, lecturers planned the use of new technologies to advantage by preparing PowerPoint presentations and other resources such as discussed immediately above. They used the skills necessary to select, adapt, or produce materials

for use in the lessons. However, in some lessons observed in Sherubtse College, CST and two lessons in Paro College, resources were not considered during planning, as they were not mentioned in the plans.

Implementation

Amidst increasing student numbers and resource constraints, lecturers remained mindful of their roles in the Colleges, presenting themselves and their work as well as they could. Although most College lecturers focussed on imparting information as transmission of content knowledge, not all the lecturers did so. Broadly lecturers who were observed across the Colleges fell into five categories on account of their planning, implementation and evaluation practices identified in the literature as: i) Imparting information; ii) Transmitting structured knowledge; iii) Directing active learning; iv) Facilitating understanding and v) Encouraging conceptual changes (Entwistle, Skinner, & Entwistle, 2000; Kember, 1997). Subsequently the roles of lecturers have been based on what was observed at that point in time.

The first category - *imparter of information* to the student was the most teacher-centred, and was observed in lecturers from four of the five the Colleges although students reported that lecturing was also evident in Paro College of Education. These lecturers presented their lessons purely in terms of handing over information, and viewed students as passive recipients of content (Calkins & Light, 2007; Kember, 1997; Prosser & Trigwell, 1999a). Typical examples were the lecturers who taught the Economics and History lessons in Sherubtse College and to a certain extent the lecturer who taught the *Chainsaw Tasks and Techniques* lesson in the College of Natural Resources.

The second category viewed lecturers as *transmitters of knowledge* (Calkins & Light, 2007; Kember, 1997; Prosser & Trigwell, 1999a). The majority of lecturers observed in this study, fell into this category, and include those who taught Mathematics, Chemistry and Computer Science in Sherubtse College; those who taught the *Insect Collection*, and *Wound Treatment* lessons in the College of Natural Resources, the one who taught the *Individual Differences* lesson in Samtse College of

Education, and the three lecturers in the College of Science and Technology.

The third category of lecturers viewed themselves in terms of what Kember (1997) described as *directors of active learning*. The lecturer who taught *Soil Water* at the College of Natural Resources, exemplified this concept of teaching to a certain extent as a concerted effort was made to encourage interaction from the students (despite the constraining factors). The other lecturers who represented this concept of the teaching role were the English Lecturer in Sherubtse College, the Mathematics lecturer from Samtse College of Education, and the *School Organisation* lecturer in Paro College of Education. They recognised the significance of student understanding and interaction in the class and made efforts to involve the students.

Lecturers who saw themselves as *facilitators of understanding* fell into the fourth category. The lecturers in the two Colleges of Education not already identified in previous roles mainly fell within this fourth category of teaching. Additionally, it is significant that the teachers of the Botany practical work and the Sociology lesson (Sherubtse College) also fell into this category.

The *facilitators of understanding* category had most of the lecturers in this role were teacher educators. It is possible that, even in their least well planned and implemented lessons, these lecturers, cognisant of the principles of teaching and learning, were able to facilitate learning and align their lessons with the LOs and to the planned assessment processes. It is noteworthy that even though the lecturers were facilitators in the lessons, there were differences in their facilitation roles. For instance in some lessons such as the Primary Mathematics, and Chemistry practical work lessons in PCE, Dzongkha and the English lessons in SCE, and the Sociology lesson in Sherubtse College, the lecturers began establishing a collaborative relationship with the students. They provided a clear description of the learning tasks, created an environment favourable to learning, and ensured that everyone was included in the learning activities. Lectures helped students to learn more effectively because lecturers listened to the students during the lesson, were sensitive to their requirements, used humour appropriately in the lessons and generally made the atmosphere conducive to learning by their resourcefulness and creativity. In this role the lecturers closely guided

students through the learning tasks.

The fifth category is *encourager of conceptual change*. None of the lecturers observed actually encouraged conceptual changes but this may not mean that such encouragement was not occurring. They were not seen to be *asking students to think critically and originally, to question existing knowledge, explore new ideas, see new dimensions* or *become independent learners* (Åkerlind, 2004). Nonetheless some traces of the above features were seen in a small number of lessons across the Colleges such as the *Sociolog*y and the *English* lessons at Sherubtse College, the *Linear Control Robotics* lesson at CST, the *Communication Approach* lesson in SCE, and *Soil Water'* lesson at CNR. Through these lessons the lecturers attempted to encourage students to *think* about their learning but it was not central nor consistent through these lessons and so did not conform to what Mezirow would consider as transformative learning. If not planned and implemented appropriately, it can be risky, and a frightening journey into the unknown for students as they are challenged to question realities and their preconceived notions about many issues. This would be a challenge to the lecturers of the Colleges, as it requires sound and deep knowledge about andragogy that is based on the principles of self direction, personal histories of experiential learning, motivation of socially relevant learning and immediate application of skills for problem-solving for adult learners (Knowles, 1973).

The scheduling of consultation hours for students to meet the lecturers one-on-one occurred only in Sherubtse College. This indicates that lecturers made themselves available outside class hours for students to consult them on the lessons, clarify doubts and ask questions they were not able to ask in class. This was a good practice considering the large number of students in some of the classes, suggesting positive and student-centred practices. It is surprising that this practice does not appear in other colleges.

Therefore, looking at the roles of the lecturers through the conceptions of teaching shows a range of practices from teacher-centred to student-centred. While lecturers assumed roles of knowledge expert in all the Colleges, they played this role in differing degrees. In some of the lessons, the knowledge expert was more evident where

they took on the 'sage on stage' role whereas others demonstrated a more 'guide on the side' role. Thus it was also found that the lecturers supported student-centredness in varying degrees across the Colleges. The finer differences in the facilitation role were evident in ways such as how the inclusion/exclusion of a particular element in teaching and learning could make a marked difference. Analysis of the case studies revealed that the lecturers in the five Colleges played diverse roles in the transmission and facilitation of learning, and may well reflect the range and diversity of teaching and learning practices prevalent across the Colleges.

Role of student

Literature related to student learning shows an empirical relationship between teachers' approaches to teaching and students' approaches to learning (Kember & Gow, 1994; Prosser & Trigwell, 1999a). Consequently, there is widespread acceptance that the role of the teachers does influence the role of the students. As observed in the preceding section, lecturers in the study fell across all five-lecturer categories from simply imparting information to encouraging and facilitating conceptual change. The students were described in roles described by Åkerlind (2004) as *passive recipients, responsive recipients, active recipients and active creator*s type of students were not confined to specific Colleges; there were both active and passive learners across the colleges.

Planning

There was no evidence of the direct role of the students in the Planning Phase of the lessons in any of the five Colleges as the lesson plans contained no evidence of students being consulted during the planning phase. On the other hand, in some lessons the roles of students were alluded to. Responsible for their learning was noted in the *Way of the World* lesson in Sherubtse College and in the *Linear Control Robotics* lesson in CST. The absence of any reference to the role of students in the planning stage implies a passive role in which students learn what was planned for them. It could be argued, however, that because there was a focus on what the students would do in some lessons, their role was considered by implication. This represented a shift in the ways

some lecturers were thinking while planning lessons.

Implementation

In the Implementation phase, the students were seen variously as passive recipients, responsive recipients, and active recipients of lessons.

In the *passive recipient* role, they were to a large degree disengaged from the lesson. The students were observed to be sitting disinterestedly, not making any effort to get involved in the lesson, while some slept quietly, indicating their total disengagement from the lesson; others appeared distracted, while some were anxious as they could not see the screen/board or hear the lecture properly (e.g Sherubtse College Computer Science and Mathematics lessons). This role could be attributed to a number of factors, such as large student numbers, over-crowded classrooms, voices of lecturers, lecturers' engrossment with their own teaching and generally where conventional 'lecturing' was prevalent and in the role lecturer as the imparter of information.

Students as *responsive recipients* were the ones who made attempts to respond to questions, listened attentively to the lecturer, and made notes. They were responsive in that they were 'involved' in the lesson and not simply sitting submissively in the classroom. Students in this category were also viewed across various lessons in the Colleges but mainly in lessons where lecturers were transmitters of structured knowledge. This type of students represented a large proportion of them in the lessons.

The third type of students, the *active recipients* were the ones who responded to questions, asked questions, got involved in the class/group discussions, and by and large were actively engaged in learning. They were observed in lessons that included organised learning activities or class discussions, such as Sociology lesson at Sherubtse College, *Soil Water* lesson in CNR and lessons at the Colleges of Education.

Only rarely were students in the fourth category, *active creators*, present in the classes observed. They participated actively in the class/group work and worked well on their own (e.g in most of the lessons at the Colleges of Education). They thought about, and analysed information in creative ways that required higher levels of thinking. Perhaps small numbers of such students were present in a few lessons across the

Colleges, but since teaching was directed at the mass of students, it was difficult to identify them on the classroom landscape using the observational judgements employed in this study - of what was observed of different roles of students in the case studies.

Of particular interest, however, was the role of students in the two Colleges of Education. As the lecturers provided planned learning activities, the responsibility for learning was placed on the students, and active participation was required. A small number of students were distracted, and not engaged with the lesson, but the large majority were genuinely involved in the mathematical games, group discussions, individual activities, and practical work. This feature was not observed in the lessons of the other three Colleges.

The idea that students in Bhutan assume specific common characteristics related to Bhutanese culture and tradition, and to their learning experiences in Bhutanese schools has been explored in some depth in Appendix 1.1 (Context of Study, see pages 393-395) and in Chapter Two (see pages 26 to 27). Together the experience of Bhutanese schooling and culture with dimensions such as *collectivism* and *power distance* appeared to play a powerful role in shaping them as College students, and imbued in them the desire for extensive course content, and a leaning towards passive learning behaviours. However, by the time they are enrolled in tertiary colleges, some students were likely to appreciate the difference between understanding and memorisation and therefore be more open to learner-centredness, and to demand the increased levels of interaction that have been seen in in some of the case studies. Consequently, it could be that some 'progressive' students - as understood from the student Interviews and comments in the In-Lesson Questionnaires made their desire to learn in much more active ways than listening to lectures and being spoon-fed ideas. They had also made suggestions for group work, more questions to be asked, learning activities in the lessons, so that learning could be meaningful and relevant for them.

Additionally the kind of students entering RUB based on Oblinger's (2003) categorisation would mainly be the Gen-Xers and Millennials. These students are greatly attracted to information technology especially the use of the Internet and are comfortable using them where accessible for their study and leisure. However, the

students may not be very forthcoming in taking responsibility for their learning and therefore require greater involvement of the lecturers thus reinforcing the transmission approach to teaching.

In summary, the roles of students varied across the Colleges and across different lessons, depending upon *what* the lecturers taught and *how* the lecturers engaged them. Although students were mostly passive, there were lessons and some parts of lessons, in which they were active, and engaged in comparatively deeper learning.

Conclusion

This chapter provided comparisons between findings in four case studies and the pilot study, a discussion of how the findings were connected to planning, implementation and evaluation practices and to what extent they agreed with, or were contrary to existing literature findings. While there were some positive practices evident, there were other practices that are unlikely to promote deep student learning in the Colleges.

In the following chapter, conclusions are drawn from the findings of the cross case analysis and the results from the five case studies, followed by implications and recommendations from the study.

Chapter Nine: Conclusions, Recommendations and Implications

Introduction

This research study has investigated the nature of teaching and learning in selected Colleges of the Royal University of Bhutan through an evaluation of the planning, implementation and assessment practices of the lecturers. The case study chapters and the pilot study (Appendix 3.9) have explored the planning, implementation and evaluation practices in the classrooms of selected lessons in five of the Colleges in depth. The chapter on cross case analysis compared the main findings of the four case studies and the pilot study.

This chapter begins with some specific conclusions based upon data analysis findings relevant to each of the three research questions. This is followed by implications, and recommendations that emerged from the discussions, and recommendations for future research and finally, a brief personal reflection of the research.

Summary of major findings and discussion

The findings demonstrated that the lecturers in the selected colleges of RUB were engaged in a combination of teacher-centred and learner-centred practices in the three phases of lessons. The study also explored the conceptions of teaching and learning and how lecturers were guided by their conceptions of teaching in the select colleges. In the following sections each phase shall be discussed together with the significant findings.

Planning

The first research question inquired into the nature of planning practices of the selected lecturers in the five Colleges of RUB. As a result of the information gathered through lesson observations, questionnaires and interviews a series of conclusions can be drawn in answer to the question:

What is the nature of the planning that lecturers engage in as they prepare for their lessons?

This section begins by highlighting significant features of planning practices and then moves to a discussion of the specific components of planning with reference to the seven categories that underpin the analysis, and which will be the basis for the other research questions.

Lesson planning

The attitudes of lecturers towards planning their lessons differed. Not all lecturers had 'written' lesson plans. It was only in the teacher education colleges that *all* of the lecturers produced written lesson plans. In other colleges it was not common practice, with very few providing written lesson plans. It emerged that lesson plans were not mandatory and certainly not common practice in all the colleges. Although the *Wheel* does not explicitly instruct lecturers to '*make lesson plans,*' such planning is implied in Section D6 of Teaching Methods (Royal University of Bhutan, 2008 p. 118) with the use of phrases such as 'carefully planned' and 'effective prior preparation' indicative of the importance that should be given to this level of planning. Thus the absence of lesson plans in some of the colleges was not in compliance with the *Wheel's* directive.

Nevertheless, although written lesson plans were absent in most cases, there was some evidence of planning, as PowerPoint presentations and lecturers' notes had been prepared. While the PowerPoint presentations and notes were not lesson plans they contained content information that was to be taught and in some ways guided the lessons. However, there were some lecturers who had neither notes nor PowerPoint presentations, yet taught the lessons in a systematic manner, which suggested planning of some kind and/or considerable experience. The body of research into teachers' planning indicates that it is good practice to write lesson plans, as it is an act of reflection (such as seen in the two Colleges of Education). Not having them in written form, but as mental constructs, does not compromise the value of planning (Lederman & Niess, 2000). Moreover, Maxwell and Kennelly (2011, p. 11) argue that much of the 'intricate detail of planning is carried in the teacher's head, especially for experienced teachers who think on their feet as they react to the context in which they find themselves'. They plan lessons mentally (McCutcheon, 1980) and planning is often

‘routine’ (Calderhead, 1984) for them.

The other issue related to planning is the lack of understanding of levels of planning among RUB academics in three Colleges. Planning at curriculum, module and lesson levels varies as the focus of the planning at each level is based on different requirements and foci. There is evidence that not all of the academics were cognisant of the distinctions and functions of the various levels of planning.

Planning specifics (reference to the seven categories)

The following discussion highlights the significant findings using the analytical framework on planning practices of the selected RUB lecturers.

Learning outcomes

The most significant observation was that all the lecturers had learning outcomes for their lessons expressed either verbally or in written form. This was consistent with the academic regulation in the *Wheel* which required learning outcomes to be developed for all the programmes and modules offered in the Colleges of RUB.

Having said that, the application of the criteria to write effective LOs was another issue. There were both well-developed and poorly developed LOs across the Colleges. While approximately 60 % of the LOs developed by the lecturers for their lessons moderately satisfied the SMART criteria, 40% did not reflect incorporation of the criteria (Appendix 8.1). On a positive note, the former contained relevant action verbs (example: LOs in the Action of Heat on Nitrates’ lesson plan of PCE) that were measurable at least to a certain extent, as well as being achievable and relevant to the lesson context. At the same time the inadequately developed LOs did not contain specific action verbs, were difficult to measure and therefore perhaps not achievable either. These LOs, therefore, were not written in a way that would lead to assessment. Overall the types of LOs were mainly subject-specific, which suggested that there was an emphasis on theoretical knowledge in the colleges, while a few were skills-based. The data indicated that there were inconsistent practices that drove the development of the LOs for the lesson plans among the different lecturers/subjects across the colleges.

Teaching and learning approaches

The study revealed that 'lecture' was the most common teaching approach planned by lecturers across the colleges. There was, however, variation in the ways that 'lectures' were presented, namely in the conventional form as well as in an interactive form. In the conventional 'lecture' (46%), the lecturers 'talked' while students listened, thus reinforcing the practice of teacher-centredness, and resulting in passive and surface learning for students. The interactive lectures (54%) included demonstrations, brief individual/group activities, class discussions, and Q&As, which enhanced interaction during the lectures. In the latter 'lecture' style, as students were more active in class activities or discussions, learner-centredness occurred, accompanied by some degree of deep active learning.

Not all the lecturers relied on conventional 'lectures', with a variety of teaching and learning approaches employed by lecturers in the Colleges of Education. What was more, the teaching and learning approaches were selected and matched to the content topics suggesting the expertise and competence of the lecturers in planning. The combination of teaching and learning approaches, with 'lecture' occupying only a small part of their lessons implies that these CoE lecturers planned for active and deep learning rather than mere knowledge transmission.

From these findings, it can be concluded that there were mixed practices in the teaching and learning approaches across the colleges.

Content knowledge

Content was the central focus in the planning stage, with most lecturers including content in the LOs. Lecturers in some colleges focussed on theoretical knowledge, while other colleges (those which taught professional degrees), included knowledge of skills related to the students' future workplaces.

Assessment

Only some lecturers included assessment (a review of the previous lesson using questions and summaries) in the planning phase.

Resources

In the planning phase some of the lessons, especially the ones in the professional colleges, had resources that related to specific skills listed. In some, textbooks were mentioned, and others referred to PowerPoint presentations. Overall, there was limited use of resources mentioned in the plans. Explanations for this may be that some lessons did not require them, or that 'lecturing' was the most commonly used teaching approach for the lessons. The findings suggest that the College of Natural Resources was well equipped with resources, with lecturers in this college noting specific resources in their plans. The paucity of resources generally available for teaching in the colleges was evident, as some colleges did not have access to essential teaching tools such as LCD projectors, reference books were scarce and even the physical spaces were congested and made learning and teaching difficult.

Role of teacher

In the planning phase, the lecturers in the five colleges were essentially observed to be the planners of the curriculum, and organisers of resources. This role was observed to be teacher-centred as the lecturers made the decisions and planned the lessons.

Role of student

The students were generally not involved in planning in real terms although some lecturers, notably those from the Colleges of Education, did take their needs into account by planning learning activities in the lessons. The students were generally dependent upon what and how the lecturers planned to engage them in the lessons.

Summary of Planning

In summary, the nature of the lecturers' planning in three (Sherubtse, CNR and CST) of the five case studies was a combination of teacher-centred and learner-centred practices. They were student-centred in that they included LOs, which suggested learner-centred practices. However not all of the LOs were written according to the precise SMART criteria. Although lectures were the main teaching approach planned

for most of these lessons, there were also other active and learner-centred approaches embedded in some classes (e.g. Sociology lesson in Sherubtse College). Content was subject-specific, and heavy with some skills-based tasks relevant to the context of the lesson.

Apart from the few instances of assessment of prior learning and reviewing what students had learnt during the lesson (which are learner-centred practices), assessment was not very well-developed in the plans. Some resources were noted for use in some lessons but overall few resources were proposed. The lessons were largely teacher-centred as the lecturers took on the role of decision makers in the planning process, and students were expected to be largely involved.

On the other hand, in the two Colleges of Education, however, the planning practices were comparatively learner-centred and demonstrated the lecturers' understanding of pedagogical principles. The lesson plans contained details not seen in the other colleges, for example the variety of teaching and learning approaches that incorporated active and deep learning strategies which complemented the learning outcomes and assessment methods.

Implementation

The second research question concerned implementation of the plans of those selected lecturers in the five Colleges of the RUB. Data gathered through lesson observations, questionnaires and interviews allowed a series of conclusions to be drawn in answer to the question:

How do the lecturers implement their prepared plans in a way that supports student learning?

This summary begins with a brief reiteration of the significant features of the implementation practices used by the lecturers in order to support student learning, then provides an analysis of the specific components of planning in relation to seven relevant categories.

Learning outcomes

Most LOs that were planned for implementation in the lessons were actually implemented. In addition there was evidence of LOs that were not envisioned during planning but which were implemented in the lessons.

While the planned LOs mainly focused on the lesson content, the unintended LOs were personal-generic, and were focussed on encouraging or compelling students to be responsible for their learning by emphasising study skills, raising awareness of scientific inquiry and creating a favourable learning environment through the friendly and good humoured disposition of the lecturers. These latter LOs greatly enhanced the learning environment. On the other hand, there were other unintended LOs, however, which did not enhance learning. Certain types of behaviour, for example the lecturers' indifference in the lessons to large number of students had a negative effect on some students, and the lecturers appeared to be too focussed on the mechanics of teaching, and thus failed to be aware of what some students, particularly those at the back of the classroom, were doing.

Teaching and learning approaches

The teaching and learning approaches demonstrated in the case studies could be looked at along a continuum, with conventional 'lecture' (which was teacher-centred and typically led to surface learning) at one extreme. Midway along the continuum was lectures with embedded activities that triggered some deep and active learning (as seen in the lessons of the two Colleges of Education). A learner-centred approach that promoted comparatively higher levels of active and deep learning was at the other end of the continuum. The distribution of the teaching and learning approaches along the continuum was approximately evenly spread, with 31% in the learner-centred approach, 31% midway between the two extremes and 38% at the teacher-centred end of the continuum.

Content Knowledge

Observation of the lessons revealed that, apart from the Colleges of Education, classes were heavily weighted with detailed content, which indicated the significance of

the transmission model of teaching. These findings are viewed in light of McCombs (1992) findings that more content does not necessarily mean more learning and indeed that it may work against active learning as more content could mean more memorisation and therefore promote surface meaning.

The results indicated that in lessons in which the focus was on content, student learning was poorly supported, because the importance of the *teaching of the lecturers* clearly outweighed the *learning of the students.* This was demonstrated by the students' behaviour in teacher-centred classrooms, with some students' attention straying from the lectures. In contrast, in lessons that incorporated student activities as well as lecturer input, students were actively engaged in their learning.

Assessment

The most common form of assessment across the case studies was 'informal formative assessment' which included observation, monitoring, questioning and providing feedback.

The skill with which informal formative assessment was implemented varied. In some lessons the lecturers coordinated the assessment, skilfully involving the students through questioning, monitoring and providing feedback on class presentations (e.g. lessons of PCE). In other lessons, the lecturers failed to implement informal formative assessment in the lessons. In the latter cases the full potential of assessment was not achieved.

Resources

A mixture of resources was employed in the lessons, ranging from the ubiquitous chalkboard to PowerPoint presentations, video films, from activity/worksheets to textbooks and manuals, real objects and models, each of, which contributed to student learning, In lessons in which the main approach to teaching was transmission of information, there was little use of anything more than electronic resources. On the other hand, in lessons in which the teaching went beyond simple transmission of ideas, greater use was made of resources to enhance the learning experience (e.g. Maths and Chemistry lesson in PCE). The data also showed that sound

instruction based on skilful teaching could occur with the help of little or no resources (e.g. the Sociology lesson in Sherubtse College).

Role of teacher

The roles played by lecturers in implementing the lessons ranged from teacher-centred to learner-centred based on Kember's (1997) five-role conceptualisation. While all lecturers assumed the role of knowledge expert, the emphasis placed on that aspect of their teaching varied.

In some of the colleges, the lecturers' were presenters of information directing the teaching in the classrooms, while in other lessons the lecturers were transmitters of knowledge. Yet in other lessons, lecturers were directors of active learning and facilitators of understanding with few possessing some characteristics of the fifth role as encourager of conceptual change. In the latter three roles, the lecturers demonstrated a more learner-centred role, organising learning activities, drawing out students in discussions, asking questions to stimulate the students to think. They fostered student discovery and guided them in ways that would enhance their learning experience. Thus the roles played by lecturers in the study ranged from mere presenters of information to facilitators of understanding, with many demonstrating a combination of both.

Role of student

In the implementation phase, students were observed variously as passive, responsive, or active participants as noted in the previous chapter. The roles they assumed were largely dependent upon the role assumed by the lecturers, and to a certain extent the learning environment created by both the lecturers and the students themselves. The exception to the roles, however was that in the College of Education the lecturers organised learning activities, which automatically engaged the students, shifting the responsibility for their learning to the students themselves. In such lessons, students were active participants in their own learning, while lessons in the other three colleges (from which activities were absent) generated passive-recipient roles for students. Only rarely were students in the fourth category as *active creators*, wherein they were provided with tasks that required thinking and analysis.

Summary of Implementation

Lecturers employed mixed practices during implementation of the plans. While some were facilitative, others were straightforward transmission approaches. The transmission approach prevailed, being commonly practised in three of the five case studies. There were examples of how lecturers' behaviour could make a big difference to the learning atmosphere even while teaching in the conventional 'lecture' style. Even with limited use of resources, a lecture could be made interactive thereby promoting student learning.

Evaluation

The final research question, which evaluated the extent to which the planning implementation and evaluation practices of the lecturers supported student learning in the colleges, revealed a mixture of practices and levels of student support.

Fourteen lecturers prepared written plans for their lessons; the other twelve lecturers did not. Most of the former were from the two Colleges of Education and had clearly reflected on their proposed teaching. Findings regarding the group of lecturers who did not have written lesson plans were not so clear-cut, and did not indicate lack of forethought or planning. In the pre- conferences interviews, these lecturers provided evidence of mental constructs that demonstrated their mental preparation for teaching the lessons. This suggested that planning practices seemingly supported student learning, as there *were* plans evident either in written form or as mental constructs. Nevertheless observations made during the implementation phase, indicated that the lessons with written plans supported student learning to a greater extent, as activities were included in the plans to engage students in active and deep learning (e.g. in the two Colleges of Education). On the other hand, lessons with no written plans were primarily preoccupied with content transmission. These lecturers had not planned for engagement of students through activities or other forms of interaction. The Q&A sessions, which could have been a valuable learning opportunity in the lessons, were not well executed, because they were ad hoc rather than planned. Nevertheless, there were exceptions to this in the case studies, with a minority lecturers who did not have written

plans still able to create a stimulating learning environment by the manner with which they interacted with students, encouraged them to respond, to share ideas and experiences. In this way, some deep learning was promoted. One lecturer in particular, created a learning environment that was positive and encouraged student learning despite teaching a 'lecture' and despite having no written plans.

Even lessons based on learner-centred practices and which included activities did not necessarily support deep student learning. Other factors, including the quality of the activities, influenced the success of such 'learner-centred lessons'. Examples of activities that were mechanical and failed to challenge students were seen in the two Colleges of Education. The activities were evidently conducted more to keep the students 'engaged' per se rather than to promote learning. On the other hand, as explained above, lessons which were delivered using the 'lecture', were sometimes successful in supporting student learning because the lecturers engaged the students in deep and active learning through Q&As and discussions.

It is evident that conflict and confusion arise when teachers who are rooted in the conventional way of teaching (viz. 'lecturing') attempt to insert learner-centred activities as required by the demands of the RUB into their teaching without a clear understanding of either the purpose or the process of such actions. Such situations are precarious as the teachers with their ill-considered ideas will not be able to implement learner-centred learning effectively with all its benefits. The activities may result in simply engaging the students in a superficial manner without significant benefits to their learning.

These findings lead to the conclusion that implementing planned learner-centred lessons does not necessarily generate opportunities for deep learning. The implication is that while deep, active learner-centred teaching and learning was expected to take place in the lessons, some of the teacher-centred lectures engaged the students and promoted deep learning through carefully planned questions, whereas some of the lessons that had learner-centred activities did not promote deep learning. So ultimately what really matters is *how well* the lecturers engage the students using either teacher-centred or learner-centred approaches at the five colleges studied. To reiterate Entwistle (2008, p.

28) that "*In the end, 'best practice' is whatever helps students to engage more deeply with the subject and to become more actively responsible for their own learning*."

The belief that time spent on active learning exercises would make it impossible to teach the required syllabus was not uncommon, and is reflected in the knowledge-transmission model of teaching that prevails in some colleges.

Implications

At a time of a growing interest in higher education in Bhutan, the intention of this study was to investigate the nature of teaching and learning in the Royal University of Bhutan. The study has demonstrated the idea that lecturers' conceptions influence their ways of planning, implementation and evaluation and how this may impact students' learning. The results indicate that there is a definite need for lecturers to evaluate their own teaching and subsequently examine their students' views of learning. This may provide a challenge to the individual colleges and university teaching as well as provide a direction for the work CULT.

Application of findings on staff support is an important result of any research of university teaching, especially for the less experienced ones, in their professional development. It is suggested that a more consistent staff development policy based on conceptions would help lecturers to develop and manage their beliefs. Subsequently, the links between conceptions of teaching and learning will assist in any future student development programmes.

The following are the specific implications for appropriate policies and actions in the areas of planning, implementation and assessment practices at the RUB that result from this study

Planning

Evidence from this study demonstrates that understanding and acknowledgement of the importance of planning varies markedly between lecturers and colleges. The implications are first of all that lesson planning should be considered as an important part of the teaching-learning process in all the colleges as it is an effective

way of ensuring student learning. Associated with this is the importance of understanding the role and functions of different levels of planning.

Perhaps the *Wheel* should have more information on planning and/or this may be something that CULT could take up in the future.

There were some misconstructions about *Wheel*-mandated learning outcomes in the lessons. There are implications for both the students and lecturers. This is because well-developed LOs can be used to express learning and make learning intentions explicit. For students the implication is that well articulated LOs clarify for them what is expected as well as the skills/competences, understanding and abilities that they will acquire on successful completion of their study. For the lecturer, the implication of learning outcomes can clarify exactly what the lesson will deliver and connect this with the appropriate mode of delivery *and* assessment.

The results of this study indicate that assessment used in the lessons was often not aligned to the learning outcomes of teaching. As noted by Adam (2004) the dynamic process of marrying outcome and learning with assessment is not simple but it can lead to better learning. In the case studies, some evidence of 'marrying learning outcomes and learning with assessment' was seen in a few lessons only but especially from the two Colleges of Education. In general, therefore it seems that assessment is a sticking point and a challenge that needs to be addressed by the colleges in particular and the university in general.

Implementation

The adoption of learning outcomes in the colleges implied making learning explicit to the students and a shift towards learner-centred learning, as learning outcomes focus on the learner. The attention is on explicit and detailed statements of what students learn – the skills, understanding and abilities lecturers seek to develop and then test. An implication of this is the possibility that since a beginning has been made in using LOs by the lecturers in the colleges; students should be actively involved in the planning and management of their own learning, gradually taking more responsibility as they develop as independent learners.

Evidence from this study suggests that the lecturers commonly employed 'lectures' as the main teaching approach except in the two Colleges of Education. Since they were so commonly used, the implication is that lectures could be effectively organised with interactive exchanges and significant discussions in order to promote active and deep learning and thus support student learning. The teacher-centred mode of lecture (non-interactive) placed the students in a passive role, and hindered learning to a large extent. If this conventional mode of lecture is to be continued, it will further embed such practices into the system. The implication is to break away from the conventional mode and make efforts to organise and develop more interactive lectures. This provides a role for Academic Deans and/or the CULT.

It should also not be assumed that using learning activities in a lesson would inevitably lead to deep learning. For deep learning to occur, they should be carefully prepared, based on the LOs and linked to assessment in the lessons. Only then can effective learning take place. Activities should not be used in the lessons as a way of outwardly keeping the students engaged but with no meaningful learning occurring. However, in some examples as seen in the case studies, the personal characteristics, and experience of the lecturers too can promote active and deep learning. But these may be exceptions and not the rule.

A significant implication, which emerges from the study, is to ensure that student learning occurs irrespective of the teaching and learning approaches used. This is the way forward: to take the middle path by using the best of both approaches when appropriate and employing them effectively to support student learning. What ultimately matters is that the lecturers should 'teach' well. Both approaches to teaching and learning have their advantages and disadvantages, and adopting the middle path would open up opportunities to use the best of both to ensure that student learning takes place. The point would be not to mandate one approach but rather build skills within the approach.

Evaluation

The most common assessment strategy employed, was informal formative

assessment. Summative assessment was used in just one lesson. In approximately 46% of the lessons observed, assessment of prior learning, class discussions, student-teacher dialogues, monitoring and observations were not employed effectively, suggesting that the lecturers were not cognisant of the significance or potential benefits of informal formative assessment. Questions were used but they were mostly superficial and designed merely to check student understanding of what was taught and not of the students' *actual* understanding.

Examples of fairly successful use of informal formative assessment were observed in only a few lessons in the Colleges of Education. Subsequently the implication is that the lecturers in the classrooms employ informal formative assessment effectively to gather information about students' understanding in order to improve student learning. The rationale is that formative assessment is essential to good teaching and learning (Black, 1993 as cited in Black & Wiliam, 1998). Effective teaching requires that teachers monitor students' understanding, and informal formative assessment is one effective tool for this purpose. If teachers do not monitor, their efforts to help students to improve, their learning is limited. Lecturers need to be aware of the significance and benefits of such a mode of assessment to enhance student learning as well as improve their teaching approaches.

In summary a different way of looking at learning and teaching at the colleges studied (with the exception of the two Colleges of Education) involves a drastic shift of perspective: a change in the way of looking at the educational world (E. Martin & Ramsden, 1987). There is an abundance of research linking teaching conceptions, teaching practices, learning conceptions and learning outcomes (Biggs, 1999; Dunkin & Precians, 1992; Kember & Kwan, 2000; E. Martin et al., 2000; Ramsden, 1992; Trigwell et al., 1999). Two studies - Trigwell and Prosser (1996b) and Kember and Kwan (2000) have established that university lecturers adopted approaches to teaching that were in line with their beliefs about teaching. Other researchers have repeated the same view: Fundamental changes to the quality of university teaching are unlikely to happen without changes to professors' conceptions of teaching (McAlpine & Weston, 2000, p. 377).

Research has highlighted the important role conceptions play in the development of teaching and learning practices. Gow, Kember, and Sivan (1992, p. 146) emphasise the important role of staff development by emphasising the significance of making changes in line with the practitioner's beliefs. Entwistle and Walker (2000) argue for staff development which would support lecturers to develop more sophisticated conceptions of learning and teaching. Ho, Watkins, and Kelly (2001) provide concrete evidence that conceptions can indeed lead to improvements in teaching strategies and eventually in student learning.

Thus if lecturers are to adopt learner-centred or effective teaching practices, then it is important to direct lecturer development and training efforts towards evaluating their conceptions of teaching and to engage in teaching for understanding.

Recommendations

In light of the fact that good teaching and learning practices are fundamental to improving student learning, the establishment of a positive climate for learning is the key to its success. Students should have access to a range of experiences that promote active learning and prompt thoughtfulness. These can be achieved through purposeful interaction and positive relationships between lecturers and students which contribute to learning that is motivating and well matched to the learning needs of students.

The establishment of institutional policies at various levels can help to inform and institutionalise effective practices. At the level of the Office of the Vice Chancellor level, policies such as those in the *Wheel of Academic Law* could reinforce and encourage effective planning, teaching and learning and assessment practices. At individual college level these practices could be effectively implemented with support from the Centre for University Learning and Teaching. The following recommendations relate to planning, implementation and assessment policies and practices, and indicate proposed further research.

Planning

It is recommended that the RUB, and the Centre for University Learning and Teaching, in particular, offer substantial professional development in writing learning

outcomes and teaching lecturers to make these explicit to students. The situation at present is that although the *Wheel* mandates the generation of LOs for all lessons and programmes offered in the colleges, this has clearly not had the desired effect, and further attention to this matter is required in order for successful teaching to follow. It is one thing to be aware of LOs, but the successful articulation of effective LOs is another. Adam (2008), the Bologna expert on Learning Outcomes, notes the challenges involved:

> *The writing and implementation of LOs is a formidable task that involves [a] huge staff development process as well as cost implications in terms of time and money. It is a massive undertaking to transform all curricula to be expressed in terms of outcomes and this often takes years to accomplish. Learning outcomes must be developed with care and sensitivity. Much depends on how they are constructed and whether (and how) they include knowledge, skills, abilities/attitudes and understanding* (2008, p. 17).

Adams summarises the significant challenges to the situation very well, while pointing out the desirability and effectiveness of well-written and implemented LOs. There is a well-established and intimate connection between teaching, learning and assessment as LOs are used to address the curriculum, and have implications for teaching, learning and assessment. Only when they are well-developed will their delivery be successful and assessment of the curriculum effective.

Adam (2008) argues that the creation of LOs is not a precise science, and they require considerable thought to write – it is easy to get them wrong and create a learning straitjacket. The purpose is to help establish and maintain standards as well as support the curriculum design. In the RUB the challenge of developing LOs should be given considerable thought and staff development programmes offered to the lecturers to establish and develop standard LOs.

The second recommendation refers to planning practices, as there seem to be confusion about understanding the relationship amongst the different levels of planning. It is recommended that policies be put in place, and that the terminology used ensures that the various levels of planning be made explicit so that there is a common

understanding of the different levels of planning. These could form part of the staff development on writing LOs to promulgate the practices of writing lesson plans and again CULT could take the lead.

Staff development programmes that enable lecturers to match their teaching practices to their intended learning outcomes for students would be helpful in raising awareness of other conceptions of teaching which were more helpful to improved learning.

Implementation

It is recommended that the RUB and the Centre for University Learning and Teaching in particular:

- Offer a series of staff development and refresher workshops and seminars to lecturers to facilitate their understanding, and thus use of effective teaching and learning approaches.

  Student engagement is also critical. Given its history and the history of the learners and teachers at RUB, the learner-centredness, that is promoted internationally, may not, at least for the present, be appropriate. Instead, a focus on *teaching well* so that students are academically engaged, may be a positive first step. This recommendation does not seek to explicitly advocate learner-centred strategies, but to strengthen existing practices such as conventional 'lectures' and suggest ways in which they could be adapted to effectively promote student learning. The *Wheel* advocates learner-centredness and focuses upon making the shift from the teacher-centred practices to more learner-centred practices. However, the findings of this study suggest that what matters is that students should acquire knowledge, skills and values that will help them to perform well during their student years and to later secure employment and thus become productive members of society.

- The other recommendation is the facilitation of professional development programmes so that all academics become knowledgeable

> and proficient in pedagogical content knowledge (PCK) besides the subject content. While it is crucially important for teachers to be well-versed in subject knowledge as they should know what to teach, it is equally important that they should know *how* to teach. Shulman (1986, p. 8) asserted that mere content knowledge is likely to be as useless pedagogically as content-free skill. Grossman et al. (1989) reinforced Shulman's assertion, suggesting that 'good teachers not only know their content but know things about their content that make effective instruction possible' (1989, p. 24). The capacity of a teacher to transform the content knowledge he or she possesses into forms that are pedagogically powerful, yet adapted to the variations in abilities and backgrounds (presented by students) is most distinctive of teaching (Shulman, 1986, p. 237).

Contemporary research indicates that PCK t positively affects student learning (Hill et al., 2008). Lecturers need to use the potential of PCK to engage the students in effective learning. PCK is important especially as it will assist in the teaching process and make student learning possible. With this understanding, it may be prudent to suggest that academics, especially the ones joining the university as new lecturers, be provided a thorough grounding in PCK so that they may effectively enhance student learning. This is in keeping with the practices of universities worldwide where all academics are required to undertake professional development with teaching (including supervision).

Assessment

It is recommended that the RUB and the Centre for University Learning and Teaching in particular:

- Offer substantial staff development related to assessment strategies that extends beyond conventional summative and formative assessment practices. Informal formative assessment in the classroom allows teachers to gauge the students' level of engagement, and provides

feedback that allows them to adjust their teaching accordingly. This kind of assessment supports rich learning moments, and the immediate responses of teachers provide feedback on the spot. Such assessment can readily be incorporated into classroom teaching and learning activities. Informal assessment techniques can be used at any time without interfering with instruction. Information gained through informal formative assessment may indicate the student's level of engagement with the lesson and performance on the skill or subject of interest.

A sound grounding in the employment of such classroom assessment techniques is required as these techniques relate directly to better learning and more effective teaching (Angelo & Cross, 1993). Since there is limited dialogue or sharing of best educational practices across the multiple campuses of the RUB, it is recommended that opportunities be created for cross-fertilisation of ideas and for the creation of shared understanding of assessment and other teaching techniques.

- The results of this study raise further issues that have not been addressed satisfactorily to date in relation to teaching at the RUB and perhaps beyond.

  The first concerns the effective use of assessment in support of student learning. While informal formative assessment was the most frequently employed in this study, and its effectiveness explored, a broader investigation and comparison of assessment strategies is called for lecturers to use assessment effectively to support student learning. In the present study a small sample of lecturers using informal formative assessment in selected classrooms was seen.

Limitations of the Research

Reflections on the limitations of the research show that while the study was a major work with far reaching consequences for the enhancement of teaching and

learning practice in higher education in Bhutan, it was not representative of all the ten Colleges of RUB. The use of case studies although beneficial in providing detailed analysis and a comprehensive picture of the lessons under scrutiny, they seem to be repetition and a rather in-depth level of detail was used to discuss each aspect of each case. Perhaps future research could employ alternate strategies such as the cross-case analysis could be used as the main data presentation mode with aspects cherry-picked from cases. Alternatively one college case analysis could have been included to demonstrate thoroughness of research method and the cross case analysis chapter expanded with the use of specific comments/observations and quotes (Smyth's report, 2013).

Future Research

Several potential research projects emerge from the study**.**

- First would be research on types of assessment practices at the programme and module levels to find out the types and identify issues related to assessment.
- A second area of study that requires further exploration is the range of formative assessment practices currently employed by lecturers across the RUB. This could be closely followed by research on conceptions and misconceptions using formative assessment practices across the colleges.
- Studies into the relationship between learning strategies and conceptions of learning would be another useful area for research. Investigation of students' conceptions of learning in different educational contexts (e.g. engineering, medical science, business studies and agricultural studies) would be valuable in order to acquire an understanding of the students' learning experiences.
- Explore the pedagogical content knowledge of the academics in the colleges of RUB. As observed in the research, it was only in the College of Education that lecturers were conversant with, and skilful in applying the principles of effective teaching and learning. Moreover research in

this area would help to make a case that PCK is essential not only for the teacher training colleges but also the other colleges.

Reflections on the research

The cross sectional design in this study was necessary in order to answer the research questions on the planning, implementation and evaluation practices which together reflect the conceptions of the lecturers. One advantage of the study is that a single researcher holds responsibility for the data collection and analysis, giving that individual a full and intimate knowledge of the study.

This study reports an investigation into the nature of teaching and learning practices in select colleges of the RUB. By its nature the study is not generalisable to other settings, but the findings can be used to inform the future of education at RUB, may prompt similar or further research beyond the RUB and beyond Bhutan.

On a more personal note this research has been similar to the Bhutanese proverb ‘looking for corners of an egg ‘ //Sgong rdog lu dzur med pa dzur ma 'tshol/.

In Bhutan, this proverb usually has a negative connotation and is applied when someone desperately tries to find issues which are difficult for others to see or of which they are unaware.

This proverb relates to this research project as in this context the implication of the proverb is exalted to the next level and related to the academic rigour and diligence of a PhD study. The negative undertone is used to highlight the contrary to achieve emphasis and intensity of what it intends to communicate.

There are two reasons that this proverb appeals. The first is based on the belief that one must make a determined effort to look for all ‘corners’ of the ‘research egg’ to find answers to the research questions as well as make original contributions. Undertaking this research study has indeed been similar to looking for ‘corners of an egg’ in the field of teaching and learning in higher education, which has already been researched a great deal by key players offering extensive insights into the possible ways teachers teach and students learn although not in Bhutan. To look for and make a small

contribution when the Bhutanese higher education is nascent is the 'corner' that I looked for in this research.

I have learned to be aware of the factors that affect the knowledge gained and the factors that influenced the organisation and writing of this research. More specifically, I believe I have become much more aware of the specific ontological, epistemological and other guiding principles that inform the research, and in particular, the ways in which the participants' experiences are interpreted. I have come to understand the paramount importance of the personal nature of learning.

The second reason is that this PhD study was an individualistic exercise using deep critical thinking skills to discover the insightful knowledge of writing a research. This is another 'corner' of the research egg - discovering new knowledge, re-learning and sometimes going beyond the possible to seek out issues so as to make the study rigorous, substantial and as exhaustive as possible. By striving to 'look for corners' in the research egg, the knowledge, skills and experiences gained helped in this endeavour to find the corners. This is what every PhD is about - looking for corners of an egg on the areas not yet explored.

Final remarks

This study has opened debate on the nature of teaching and learning practices in RUB in areas that have not been previously studied.

A significant finding is that simple adoption of western models of teaching and learning will not necessarily answer the challenges of tertiary education in Bhutan. There are other factors such as cultural appropriateness, availability of resources and the consideration of *how* the lecturers can successfully implement teaching-learning in order to promote student learning. By realising this RUB should chart a 'middle path' by taking the best from good western practices, keeping the cultural appropriateness of teaching and learning conceptions of the Bhutanese lecturers and students at the forefront.

Clearly there is work to be done to make teaching and learning practices in higher education become more congruent with RUB policies and so cater to the

emerging needs of the country and support the current philosophy of Educating for GNH in Bhutan.

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