# A strategy for using digital mindsets and knowledge technologies to move past pandemic conditions

Cherry Stewart Department of Education, University of New England, Armidale, Australia, and

Ashfaq Ahmad Khan UNE Business School, University of New England, Armidale, Australia

## Abstract

**Purpose** – The purpose of this paper is to discuss the theoretical concepts of adult constructive development (ACD) in response to a requirement to teach fully online during the COVID-19 lockdown. However, responses have been unique for many university educators, regardless of the roles they have in supporting students during this time. How each person approaches the changing context can be enhanced by an understanding of their mindset as defined by Kegan's theory.

**Design/methodology/approach** – An accounting academic and educational designer combine their expertise and engage a "digital mindset" to guide the re-design of the management accounting unit incorporating strategies that encourage students to be self-reliant yet learn from a broad diversity of perspectives.

**Findings** – Unexpected changes within an educational environment may be the catalyse needed to force significant rethinking of pedagogical practice within the online teaching space.

**Practical implications** – This paper offers practical thinking and design tips for creating interactive learning and teaching programs to develop a positive and supportive approach that challenges and facilitates cognitive growth in student knowledge, skills and learning behaviours.

**Social implications** – Stimulating student interaction via the creation of interactive and dynamic online curriculum design teachers may communicate more effectively with students as well as sharing their knowledge and skills with each other.

**Originality/value** – The authors explore Kegan's ACD framework (1982, 1998, 2009) within the context of tertiary teaching and learning design for management accounting. The authors propose online strategies for each of the levels of development in the form of supports and challenges.

**Keywords** Learner-centred curriculum design, Activity-based learning, Online tertiary education, Accounting education, Constructive-developmental theory

Paper type Conceptual paper

## Digital mindsets

The pandemic has reshaped the tertiary education landscape, shifting its operating conditions as well as teaching and learning processes and procedures, both tangible and intangible, for educators and students alike. Not only teachers, but educational designers, executives, administrators, examiners, system designers and even the students are being asked to change their thinking about how formal higher education is delivered and learned and ultimately who is responsible for that learning. The altered form of teaching brought about by the COVID-19 lockdowns opens up opportunities to consider more closely the theory of adult constructive C

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Received 11 September 2020 Revised 9 December 2020 Accepted 11 December 2020 development (ACD) (Kegan, 1998) and its relationship to exploring digital practices when designing staged self-directed learning (Grow, 1991) and online education. This paper develops the argument that the pandemic has created opportunities for university educators to consider strategies for the development of self-transforming mindsets. In doing so, educators encourage students to engage in reflective learning. Reflective strategies would invite interaction between students and multiple learning elements:

- teacher/learner-interface;
- teacher/learner-content;
- teacher/learner-teacher;
- teacher/learner-peers; and
- teacher/learner-self, encouraging the development of diverse problem-solvers and independent life-long learners.

Mindsets act as filters, selectively shaping and limiting perceptions, cognition and feelings, thus focussing attention on a particular form of action (Haager *et al.*, 2014). The use of the term "digital mindset" in this article refers to ways of thinking and meaning creation developed over time through contextual interactions and personal relationships within a digital landscape. In this context, it is not just the ability to use technology but also the attitudes and behaviours that enable educators and their students to extend their thinking and adapt to new opportunities.

Adopting a digital mindset is a cultural shift in one's thinking. Educators who remain in a "fixed mindset" are unwilling to adapt. They may continue to use the same tools and teaching strategies within the online context, although teaching online requires different approaches (Ni She *et al.*, 2019). A digital mindset requires an understanding of not only why it is important to change one's approach but also acknowledging the changes required in one's values and standards of judgement which influence decisions made when designing, delivering and assessing learning events. Laurillard (2012, p. 3) quite importantly highlights that "Knowledge technologies shape *what* is learned by changing *how* it is learned". In short, a digital mindset requires educators to think differently about the relationships between the various elements of the learning experience.

In addition, tertiary-education staff not directly involved in the design of curriculum need to be aware of the differences between traditional forms of delivery and the changes required to support structures and processes when moving to online education. Thus, a mindshift may be required of all personnel associated with the ultimate delivery and accreditation of a tertiary education that would facilitate learners who are future-ready to independently tackle life-challenges.

#### Adult constructive development

The stage-based ACD theory links ways of thinking with levels of mental complexity and variable mindsets (Kegan, 1982, 1998; Kegan and Lahey, 2009). Kegan's theory extends stages of development into adulthood and emphasises shifts in meaning-making capacity and ways of understanding world phenomena. With the ever-changing and increasing complexity of our social and professional worlds, Kegan maintains that adults face "adaptive challenges" (Heifetz, 1994) which they may approach through differing "ways of knowing" (Table 1). In Kegan's words, "It is about the organising principle we bring to our thinking, our feelings and our relating to others and our relating to parts of ourselves" (1998, p. 29). Kegan's "developmental perspective offers a lens through which we can better view

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el of ACD	Mindset of the person at Kegan's ACD levels	Mindset regarding teaching	Mindset regarding learning
	A person at this level: Has a "what do you have that can help me" orientation; Tends to follow rules and feel supported when others provide specific advice and explicit procedures to accomplish their work; Struggles to take another's perspective or convider multiplo correspondence	An educator at this level: Information and skills are transferred through modelling and acquisition Reward and punishment in form of assessment and marking are paramount Learning is maximised through chunking, schemas and scripts Content is individualised, information-	A student at this level: Seeks approval and direction from authoritative "expert"; Little interaction with peers Focus on content memorisation and recall Passive learning Passive learning
	A person at this level: A person at this level: RA person at this level: reflect on people's actions; Subordinates his or her needs to the needs of others; Experiences interpersonal conflict almost always as a threat to the self. Finds acceptance by authorities of the highest importance	based and nour-remective An educator at this level: Adopts thinking of dominant group (colleagues and/or policymakers) Provides support on individual basis and/or encourages peer interaction Product focussed individual and collective practices Promotes individualised interaction unable to foster interactive discussion or debate	A student at this level: A student at this level: Attends to the actions and thoughts of others in the class Seeks to "fit-in" with the concepts and ideas expressed by peers and authority Success is aligned with the actions of others Allows more dominant students to take lead Participates in "group-think" seeking
	A person at this level: Identifies abstract values, principles and longer-term purposes; Is able to prioritise and integrate competing values; Identifies achievement and responsibility of uppermost concerns	An educator at this level: Acknowledges diversity of students recognising and planning for varying levels of student ACD Encourages reflective engagement and interaction Views outcome as a developmental practice Adopts digital mindset (integration of pedagogy and technology) Seeks out new practices and builds on the Work of others	A student at this level: Considers own learning needs Sets and achieves own goals Self-evaluates based on informed reflection Seeks to resolve conflicts reflecting own values and perspectives
50	A person at this level: Is less invested in their own point of view;	An educator at this level: Recognises the adaptive challenges inherent	A student at this level: Considers own learning needs in (continued)
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ARJ 34,3 <b>348</b>	Mindset regarding learning	relation to those of others Engages in collaborative learning – giving and receiving feedback from peers as well as expert sources Seeks to innovate, invent and invigorate diverse problem – generation and resolution Produces products for peer and expert evaluation and feedback Engages in diverse and relational conflict resolution tewart, Khan and Hedberg, 2013)	
	Mindset regarding teaching	in learning technologies and modulates in reference to student ACD Reflects on practice, seeking critical review from peers and students Actively facilitates student interaction and collaborative production Supports others by representing and sharing pedagogic practice and related outcomes Encourages student diversity in thought and action Promotes student creation of learning content and authentic assessment relative to the individual or group tey, 2009); (Stewart and Wolodko, 2016); and (S	
	Mindset of the person at Kegan's ACD levels	Examines issues from multiple points of view and sees where seemingly opposite perspectives overlap; Is strategic – understands and manages tremendous amounts of complexity; Makes decisions based on the common good for group, organisations and society for group, organisations and society for group, organisations and Laface and Laface Severson, 2008) based on (Kegan and Severson) Severson (Kegan and Laface Severson) Severson (Kegan and Severson) Severson (Kegan and Severson) Severson) Severson (Kegan and Severson) Severson) Severson (Kegan and Severson) Severson) Severson (Kegan and Seve	
Table 1.	Level of ACD	Source: Adapted from	

people's attitudes, behaviours and expectations and understand how to support growth in individuals with different ways of knowing" (Drago-Severson, 2008, p. 54).

That is, when circumstances change, new thinking is required which would take into account the changes within the context and purposefully pursue desired outcomes under challenging circumstances. When an educator has always delivered their teaching via a classroom-based strategy and is suddenly required to interact with students and assist their learning within a fully online program, the educator would do well to re-evaluate their own, and their students' positions and responsibilities by recognising the new contexts. This may require new learning on the educator's part, as well as that of students. Similarly, executives, administrators, examiners and system designers who support the work of teachers and students may also require a mindset shift; as would members of professional organisations who set the guidelines and standards which impact on curriculum design.

#### Harness technology

The pandemic has provided a universal context to which most higher education institutions around the world responded with a full-fledged move of educational materials and teaching staff to a fully online teaching and learning environment. For many, these changes have focussed on replicating distance learning or classroom strategies without due consideration to the implications of using the digital technologies applying appropriate pedagogical considerations.

Maximising the use of internet-based digital tools for student-centred learning appears to be fraught with difficulties. Prior to the pandemic, experts suggested innovative flexible learning environments would be a long-term trend in higher education (Johnson *et al.*, 2015). They indicated that an improvement to academic digital literacy and academic understanding of innovative and effective pedagogical design, while considered a solvable challenge, was also termed "impossible to define". But define we must, in well-defined terms, if a meaningful and lasting progress is to be made. Technological enhancements to the learning process would be characterised by "more risk-taking, collaboration, and activities that more accurately reflect the contemporary workplace" (p8).

The 2019 Horizon Report (Alexander *et al.*, 2019) highlighted impediments to wideranging technology adoption in higher education, of which rethinking the practice of teaching is classified as a wicked problem complex even to define, much less address. In 2019, the authors felt the issues associated with improving digital literacy and providing instructional design support were solvable. More difficult were the evolving roles of the teaching staff. While educators might understand the need for a close collaboration between content and instructional design expertise, the administrative solutions to achieve such collaborative endeavours remained elusive and of low priority for many universities.

Ni She *et al.* (2019) highlight ten roles and competencies involved in providing effective online learning. These are related to: management, pedagogy, social interaction with and between students as well as colleagues, technical, assessment and feedback, facilitation, content expertise, learning design, research (both discipline and pedagogical) and course evaluation. Enactment of these, require contextual self-transforming minds of policymakers, administrators, teachers and students to empower action to deal with the new complexities of the modern era. Few universities have integrated systems that support the activities and effective coordination associated with these roles.

#### How does adult constructive development apply to digital teaching?

New forms of thinking are required when teaching changes from a classroom-based strategy to a fully online program (Table 1). The use of digital tools can assist the transition

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between levels of mental complexity if the educator recognises their transformational power when used with a digital mindset (Stewart and Wolodko, 2016). Learning technologies provide spaces for interaction, communication and user-control which fit well with the concepts of social-constructivist active learning; however, multiple researchers have shown that despite wide application, the results have not met expectations (Harris and Phillips, 2018). The lack of change is believed owing to educator misunderstanding the benefits of different practices, their inadequate practical pedagogical skills and the constraints of time with little incentive to develop changed practices (Becta, 2008).

Ni She *et al.* (2019) maintain that teaching online is quite different from teaching face-toface in a classroom environment. Hence, given the context the tertiary sector now operates within, a drastic shift to an online-only learning and teaching context requires a similar shift in educators' mindsets towards using knowledge technologies which may enhance student engagement. The overarching shift seen in the progression through four ways of ACD is from *dependence* to *independence* to *interdependence*. Each of the five learning design elements identified previously will alter in terms of interaction and the knowledge creation processes for those involved. Teachers cannot act alone to embrace and implement the change as there are wide-ranging systemic issues that need to be simultaneously addressed, such as the politics of education and multiple demands for maintaining archaic methods of assessment and quality assurance. Designing and implementing learning activities that will service developmental growth within changing and complex social and professional contexts requires a solid understanding of the tools and technologies available. Fostering student growth mindsets means integrating knowledge and skills via digitally enabled pedagogical strategies. These demand advanced educator skills which supplement their expertise in the discipline content. Figure 1 diagrams the relationships and considerations of implementing ACD informed online learning. A key consideration is the implementation of both supports and challenges appropriate for each level of ACD. These may be applied using technological tools in a static, interactive or immersive form mapped against the intended outcomes.

# Shifting mindset

Online learning contexts require the educational professional to be ever aware and observant of the learner's priorities in relation to societal needs. They must adjust their guidance and support to maximise results towards an agreed (with the learner) learning goal. Achieving this service orientation requires a delicate balance between pragmatic and



limited content provision and good pedagogical practices to engage learners deeply. Moving from a classroom orientation (regardless of one's experience with digital tools) to an online learning context requires a different perspective on what learning is, what responsibilities are involved and who will contribute to their enactment.

In a COVID-19 context what academics believe regarding the ways and means of providing a tertiary education may no longer be relevant, yet difficult to remove from our mindset frame, which Kegan and Lahey (2009) have identified an *immunity to change*. Concepts are impacted by hidden assumptions impinging on one's ability to envisage new and innovative learning paradigms. The thinking behind a decision to create engaging online design is derived from multiple information bases and necessitates the recognition of hidden assumptions, or what Chanowitz and Langer (1981) describe as a suspension of cognitive commitment. It requires one to be mindful of the components of an online educator's roles as identified by Ni She *et al.* (2019) and to consider how these might be integrated to create a holistic learning environment to maximise student ACD growth and transitioning. Solutions require new approaches, and these may emerge as enactors work collaboratively on them. Each of the stakeholders' responsibilities must be weighed up. Enactors must seek support and engage in an adaptive design challenge.

What sorts of changes would pandemic conditions instigate? An adaptive curricular design challenge must look to the learning context and provide modifiable learning tasks that would allow learners to take control of their own learning in relation to their own development. An adaptive design takes into consideration an:

[...] increasing awareness and practice of positive learner-centred relationships (rather than content-centric) that involve non-directed behaviours, empathy and warmth and encourage student thinking and learning while interacting with others — qualities that are required for positive cognitive restructuring and changing mindsets. (Stewart *et al.*, 2013, p. 101)

The following sections shed some light on this.

#### Pedagogical change for post-pandemic teaching

Creating adaptive post COVID-19 teaching and learning solutions requires suitable adaptation of digital tools to implement knowledge technologies. Knowledge technologies are defined as intelligent, information or interaction technologies that support the creation and management of knowledge at various individual and social levels. Digital tools become knowledge technologies in the hands of educators. Learning how to use digital tools to shape what is learned within such a short time frame as necessitated by the pandemic is complex and challenging. A substantial amount of planning and preparation must go into the design of online curricula, as well as the significant shift in one's thinking as the authors have outlined previously. Working collaboratively with colleagues who possess pedagogical, technical and discipline expertise is a minimum requirement for being able to facilitate active and engaging learning environments online. Within the university establishment, accessing support to make such changes has been quite impossible owing to the very heavy demand on an organisation not adequately prepared for such changes. Many changes to the online materials are often impeded owing to university policies and procedures, marketing timelines, perceptions of appropriate assessment practices and professional association requirements. To make such changes would involve lobbying with university administrators and considerable political finesse on the part of the educator who seeks a change to policies.

Table 2 provides suggestions which may be enacted over time and planned to meet the needs of developing teachers and students within their respective teaching and learning

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352	Challenges to enable growth	Create tasks that require abstract thinking and scaffold learning thu the process Encourage alternative thinking an viewpoints Provide alternative pathways tow completion of activities Acknowledge and reward an understanding of multiplicity of meanings and pathways towards achievement	Encourage learner to offer sugges and points of view in online discu forum or web-based communicati technologies (e.g. wiki) Support the construction of group values and standards rather than setting goals and guidelines withi group tasks Challenge the learner to tolerate a accept conflict without feeling threatened when challenged by p Support learner to see conflict as of team growth and personal enhancement Challenge the learner to set their tasks and standards for achievem within the group setting bi-houncie set evaluation and	Supportator peet reconden- support learners to deal with interpersonal dimensions of group work as opportunity for personal growth
	Supports for growth	Set clear expectations and guidelines Explicitly state a timetable and concrete goals to be achieved by certain dates Focus on the learner's concrete need to achieve desired results	Create environment where learner feels confident asking questions and sharing own opinions Offer strategies for recognising and resolving internal conflict Provide opportunities to share own perspectives in pairs or small group Scaffold guidance and suggestions for achieving group task Include goals that involve a sense of obligation or loyalty to another person or group	Greater degree of autonomy Provide tasks that expose the learner to diverse viewpoints and perspectives Ask group to analyse and critique
	Experience of learning	Content defined and prescribed Set tasks requiring interaction with others Promote discussion and debate Provide problem-resolution task	Offer opportunities for group work Acceptance from important others confirming values and achievements Endeavour to sustain compatible grouping, (conflict would be threatening)	Learn from and with others Self-evaluating within the context of group work Evaluate and adopt congruent
Table 2.Potential wayslearners mayexperience the unitbased on theirpeculiar way ofknowing	Way of knowing	Instrumental	Socialising	Self-authoring

Way of knowing	Experience of learning	Supports for growth	Challenges to enable growth
	principles offered by other group members, to support their own growth and development Conflict is recognised as a natural occurrence of group work	proposals or tasks Engage in dialogue and/or debate to determine how task is to be achieved based on member talents, capacities and resources Provide opportunities to explore self- determined goals in relation to the intended outcomes	Challenge the learner to recognise the relative and constructed nature of own goals and plans, particularly where they may be opposed to other activities or suggestions Challenge the learner to set aside their own strongly held beliefs and to "try-on the other's shoes"; reflecting on the personal movement in values Challenge the learner to experience <i>self</i> as process. driven (trather than product driven) (e.g. completing an assignment or <i>activity</i> ).
Self-transforming	Seeks collaborative interactions respecting others' perspectives Recognises and focuses on interpersonal dimensions of collaboration while also working towards common task completion Able to situate their collaborative efforts managing complexity and multiple viewpoints Able to find acceptable (to all) principled solutions	Allow for independent practice and deep inquiry and self-expression Encourage broad diversity in group members and perspectives (age, gender, race, social location, experience and forms of participation) Allow group structures that are open to change and adaptation	Support this learner in sorting through multiple points of view Challenge the learner to cope with and manage hierarchy
Source: Adapted from	1 (Drago-Severson, 2008)		
Table 2.			Digital mindsets and knowledge technologies <b>353</b>

spaces. All educators, as well as students, will be at differing levels of ACD. A clear alignment between the various ways of knowing effected by teachers and students, or between peers, is not always possible. In shaping a learning environment (an online-only course) that will support both teachers and students who have different ways of knowing (level of ACD), is impacted by two fundamental principles:

- (1) a balance between high support and high challenge for students; and
- (2) the fit or match between the course structure and strategies and the students' ways of knowing.

In each situation, the design of the activities need to meet the learners' needs relative to their individual levels of meaning-making (Drago-Severson, 2008). The environment must be constructed to provide multiple options as students will be at multiple-levels along the ACD journey. It must also encompass strategies for offering "challenges" that encourage the learner to grow towards a new way of knowing, as described above. A robust learning environment can enable learners (and their teacher) to move from one point to the next on the developmental continuum.

#### Adaptation to the management accounting unit

The purpose of the introductory course in management accounting is to enable students understanding of fundamental principles for designing and implementing management accounting systems within business organisations. One goal of the course is to help students differentiate this discipline from financial accounting. Organisations function in rapidly changing environments. These changes are brought about by advances in technology in its various manifestations, changing societal values, increasing levels of environmental degradation, as well as globalisation. The cost-management systems within organisations ought to anticipate challenges that consequently arise and react in an efficient manner. Successful management accountants are ultimately practitioners, working within the organisational hierarchy. They partner with other members of the management team in line authority, broadening their perspectives to help manage organisational resources in an efficient manner. They may be required to take calculated risks, engage in reflective practice, examine assumptions and behaviours and provide professional advice to managers on cost/benefit aspects of various strategic decisions made regarding their routine duties. The purpose of the unit is to open-up the subject beyond its technical treatment as presented in a textbook supporting students to analyse any business situation that may arise in practice despite non-familiarity. In these circumstances, they will need to operate at the "selftransforming" levels (Kegan and Lahey, 2009) of mind.

This unit is an integral part of some undergraduate courses, thus, attracting students at varying levels of the ACD continuum. The educator has determined that there are notable differences between the school-leavers who enrol in the unit and the mature-aged students. A notable percentage of the younger-aged students approach the unit with a mindset of doing the bare minimum in terms of study and devotion to the provided learning resources. They are believed to strictly limit their effort and time input towards what is required as "compulsory" within the unit design. It is a challenge for the educator to engage them in activities which require time and effort on their part unless the activity is mandatory and attracts points towards their final grades. The educator has found that pressing this cohort "hard" particularly for activities that are non-mandatory contributes to a high attrition and ultimately negatively affects unit evaluations. We may identify these learners as "Instrumental Knowers" (Kegan and Lahey, 2009). The mature-age learners tend towards more independent learning strategies; however, they too, seek to complete activities

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individually owing to their personal time constraints where they may be working and managing family affairs in addition to study. The participants may be evaluated as "Self-authoring Knowers" (Kegan and Lahey, 2009) focussed on their own needs and goals.

Table 2 outlines strategies which might be taken into consideration when designing curriculum activities. A specific program outline with complete details could not be provided here, as there are many different ways a learning designer or an educator could approach the process. The strategies learning designers would adopt often reflects their own level of confidence within the various roles identified by Ni She *et al.* (2019), as referred to previously, and the level and type of support provided by their university. The educator aims to incorporate a couple of small-scale tasks for students to interact with peers within the unit's online learning space. Tasks will be designed with an explicit aim of helping students adopt a growth model of learning. Unit changes to management accounting will be made for its next implementation – Trimester 2, 2021. It should be noted that the design process for these changes takes time and effort as well as acceptance by the academic board. The educator and learning designer will collaborate in mapping the unit (Conole *et al.*, 2004) to ensure that supports and challenges for differing ACD levels are included.

# Closing thoughts

When altered circumstances, as have recently been experienced, force educators *and* learners to rethink their educational opportunities, transformative educators may find creative solutions rather than reactive ones. Instead of bringing up the drawbridge in a closed and defensive stance, they may find that being open and curious leads to a mindshift and innovative learning programs better suited to the changed internal and external circumstances. The pandemic may force educators and learners alike to take responsibility for how they respond to circumstances beyond their control and to find new ways of thinking within their sphere of control.

The authors of this paper strongly advocate that educators who would incorporate online learning into their daily practice make their own informal learning a priority. They would do well to build a personal network of colleagues who may or may not be engaged in online learning development. Forming discussion groups that meet on a regular basis to exchange ideas, successes and challenges will promote their own ACD growth and ultimately support progressive engagement and growth opportunities for their students. It is important to not underestimate the time that is required to make personal changes to one's own mindset, or that of colleagues, university executives, administrators and support staff. However, a beginning must be made.

Administrators in universities must not devalue the time that is required to develop and sustain online courses. Going online is not a cost-saving activity. It can become a highly valued growth opportunity for all involved. Additional faculty development opportunities that go beyond an emphasis on technology and include an understanding of the relationship between pedagogy and personal growth should be encouraged.

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Corresponding author Cherry Stewart can be contacted at: cstewar3@une.edu.au