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Discovering the Hidden Work of Commodified Care: The Case of Early Childhood Educators

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Abstract: The COVID-19 pandemic has drawn attention to the care economy, including commodified early childhood education and care (ECEC). While there is some literature about the low paid, invisible, and undervalued skills among the predominantly female workforce in the ECEC sector, there is little research into what these educators do in their working day and how this contributes to quality education and care for young children. This article provides a detailed examination of ten defined domains of ECEC work tasks, derived from data generated by educators' use of 'intensive hour' time-diary methodology. The results reveal that the outstanding characteristics of this occupation are multi-tasking and the rapid switching of tasks as educators manage diverse expectations arising from work with groups of very young children, families, other staff, and meeting legislated responsibilities. Drawing on William J. Baumol's economic theory, we consider the implications for productivity and cost tensions in ECEC.

Keywords: care work; early childhood education and care (ECEC); labour process; time allocation; productivity; labour supply

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1. Introduction

The COVID-19 pandemic has drawn attention to the 'Care Economy', long identified by feminists as a neglected aspect of the economy (Cantillon et al. 2021; Folbre 1995, 2021; Himmelweit 1999; International Labour Organisation 2020; Kimmel and Connelly 2007). The care economy involves services that nurture and support populations—children, the elderly, the sick and the disabled—and includes services such as health care and early childhood education and care (ECEC). As well as nurturing and supporting sections of our population in need of care, services such as ECEC generate and renew human capabilities and functions (Sen 1985). Much of this care is unpaid and produced by households[1], but a growing proportion is commodified. The vast majority of unpaid and paid care work is undertaken by women (United Nations 2020). Commodification occurs when care is removed from the space of unpaid labour and instead becomes a product that can be transacted through the market (Himmelweit and Plomien 2014). In many countries, including Australia, the provision of ECEC as a 'product' occurs within a mixed market economy. That is, much ECEC is provided by businesses, a smaller proportion by not-for-profit entities, and others directly through jurisdictional education systems (Cleveland and Krashinsky 2009; Press et al. 2018). In this context, commodification takes place—firstly, through the provision of care for children via the market rather than private domain, and

secondly, its presentation as a product to be 'bought' rather than a service directly provided to children in the way, for instance, that state schools are provided. Hence, ECEC becomes part of the 'care economy'. The provision of paid care services is anticipated to be the fastest growing occupations in the advanced economies—faster than the 'tech' sector[2]. Analyses suggest post-pandemic investment in the care economy will generate more jobs and a speedier recovery than the traditional approach of building infrastructure (De Henau and Himmelweit 2021; De Henau 2022).

In most advanced economies, including Australia, many women with young children remain outside the paid labour force. In Australia, just over one-quarter (25.7%) of two parent families with young children (0–4 years) have both parents working full-time (Australian Bureau of Statistics 2023). In a recent survey of incentives and barriers to labour force participation, women cited 'caring for children' as the main reason they were unavailable to start work, with lack of childcare identified as a barrier by 39% of respondents (Australian Bureau of Statistics 2023–2024).

Thus, the decision about whether or not to re-enter/enter paid labour can be impacted by the accessibility and cost of ECEC. Ensuring a stable, well and appropriately qualified ECEC workforce, and accessible affordable ECEC services are pivotal for enabling families to participate in the labour market to the extent they wish (Commonwealth of Australia 2017). Therefore, the key concerns of ECEC policy are availability, access, quality and cost, with availability and access primarily being issues of geographic location (OECD 2019). A crucial issue in regard to costs and quality is the tension between the cost to users and the value placed on employees' care work through what they earn. Where the market prevails, costs are controlled by the inappropriately low pay of educators, resulting in the glaring mismatch between the skills required and the low rates of pay (Irvine et al. 2016; Steinberg and Figart 1999; England 2005; Findlay et al. 2009). A factor that contributes to the suppression of wages is the misconception that the 'care' work is, for women, instinctual rather than skilled (Press et al. 2018). Like other sectors of the care economy, ECEC has a highly feminized workforce with nearly 97% of ECEC educators, female (Press 2015).

Despite their economic and social importance, there are limited studies[3] of care occupations, especially those aspects of the labour process that affect the ability to scale-up services and reduce cost. This paper seeks to address this gap by describing a study of educators working in ECEC services. The data reported in this paper provide a detailed examination of educators' use of time, drawing on the first component of a three-phased research project investigating the nature of educators work in high-quality early childhood settings (Press et al. 2020).

From an economic perspective, the approach that has been typically applied to reducing costs, is through increasing productivity. Typically, economists calculate productivity through dividing measures of outputs by measures of inputs (e.g., Reserve Bank of Australia n.d.). So, for example, increased productivity in the manufacture of goods has been based on technological advances, resulting in an hour of labour time (an input) progressively producing more and more output, reducing the price of goods, while also justifying the payment of higher wages (Himmelweit and Plomien 2014). However, cost containment through increased productivity may not be appropriate as advanced economies transition away from employment in manufacturing to employment in providing services.

The economic theorist most associated with ideas about productivity in the service sector is William Baumol (1967, 1996). Baumol's theory is used to understand the rising cost of areas such as municipal government, education, the performing arts, restaurants, health care, and elements of the care economy (1967, 1996). Baumol uses the term 'stagnant sector' to refer to labour-intensive sectors in which productivity is relatively immobile but where, nevertheless, wages rise. In contrast, the 'progressive sector', typified by manufacturing, sees productivity increases that are able to both contain the cost of goods and support wage growth. According to this theory, the services produced by the 'stagnant sector' become ever more expensive because the 'products' they provide cannot be produced any more efficiently without corroding their very essence. Thus, Baumol was also concerned that in

an environment of increased income inequality, the rising cost of services produced in the so-called stagnant sector will have the largest impact upon those on lower incomes who find themselves priced out of such services. This then becomes a social issue as inequalities are exacerbated (Baumol 2012).

The most famous example of Baumol's principle is from his study of the performing arts (Baumol and Bowen 1966) in which he observed the playing of a string quartet where 'neither cutting the number of players nor playing faster could raise productivity without substantially changing its nature' (Himmelweit 2007, p. 584). Baumol (1967) generalizes from this example saying the following:

The basic source of differentiation [between the progressive and stagnant sectors] resides in the role played by labour in the activity. In some cases, labour is primarily an instrument—an incidental requisite for the attainment of the final product, while in other fields of endeavour, for all practical purposes, the labour is itself the end product (p. 416).

In the performing arts, the performance (the labour of playing the instrument) is the product. In this paper, we ask how Baumol's argument might apply to ECEC work. Is the labour of educators the end product in itself—seen in the provision of high-quality education and care for young children? Or is the end product the development of capabilities and functions that are only fully expressed in the future, potentially when these children become adults, as Heckman and Masterov's (2007) argument for investing in ECEC for pre-school age children has demonstrated. In relation to the care economy, including ECEC, the implication of Baumol's theory is that it is hard to raise the productivity of caring through reducing inputs. As Himmelweit (2007) states, "what in other industries would be seen as measures of high productivity are specifically taken as indices of low quality when it comes to care" (p. 585). Thus, for example, decreasing the number of staff to children would reduce the cost of labour as an input, but would have an adverse impact upon the quality of care that children receive. Like Folbre, we argue that the capabilities and functioning created by the work of educators in the ECEC sector may be viewed as public goods (Folbre 1994). This also means that those who work in ECEC must not themselves be priced out of using ECEC for their own children. As Paula England (2005) wrote 'even staunch neoclassical economists recognise that, in the case of public goods, because the social return is greater than the private return, markets will undersupply, and thus there is an argument for state provision' (p. 385).

We commence by reporting on data from a time-use study of early childhood educators in Australia ECEC. These data highlight the very constraints of demanding more 'productivity' from the sector. While investing in good quality ECEC makes the most cost-effective difference to long-term outcomes in adulthood (Heckman and Masterov 2007), there is minimal evidence on labour processes in ECEC; that is, no direct study of the allocation of time to the various tasks undertaken in ECEC that exposes its organisation and its 'technology' of production. This article, based on research in Australian ECEC services, seeks to address this gap, using time-use methods to gather the details of the labour process in this crucial part of the care economy.

2. Method

This research was conducted in a national sample of high-quality Australian ECEC services for children under school age. Australia's ECEC sector is nationally regulated, and its quality rating and improvement (QRIS) system assigns quality ratings of 'Exceeding National Quality Standard (NQS)', 'Meeting NQS', 'Working Towards NQS', and 'Significant Improvement Required' (ACECQA 2018). High-quality centres are especially interesting because there is strong interest in the requirements necessary to provide good quality caring labour. In this study, recruitment was directed to ECEC preschools and long-day-care[4] centres that had achieved (1) a current overall rating of Exceeding NQS, and (2) a ranking of 'Exceeding' in each of the seven NQS standards and their rateable sub-elements. After consultation with the Australian Children's Education and Care Quality Authority (ACECQA)[5], we approached eligible centres in all of Australia's states and territories

by letter or email using a staggered rollout to provide greater flexibility in recruitment. Educators who worked directly with children were invited to participate.

ECEC educators in Australia are diversely qualified, with mandated qualification requirements for degree-qualified teachers, Diploma, and Certificate III-qualified educators (ACECQA n.d.). In this article, we use the term 'educators' to refer to all qualifications, while 'teacher' refers only to those with a university degree in early childhood education. Educators are also classified by role. All educators provide direct education and care for children, while 'Room Leaders' and 'Teachers' have added responsibility for curriculum decision-making, and 'Assistants' enact and support curriculum delivery. Leadership positions include 'Centre Director' and 'Nominated Supervisor' with responsibility for day-to-day management and ensuring compliance with national laws and regulations (ACECQA 2018). Our recruitment was directed to teachers and educators who worked directly with children. Centre Directors were not included unless their work week included a regular allocation of time working with children.

This study used an 'intensive hour' method to collect data about the time ECEC educators allocated to work tasks. This method provides information that a conventional full-day time-use diary such as those used by national statistical organisations (United Nations 2005; EUROSTAT 2020) may avoid, due to a heavy burden on respondents asked to report on specific employment-related tasks over the full workday. The 'intensive hour' technique avoids this obstacle and reduces respondent burden. Pilot work for this study (Harrison et al. 2019; Wong et al. 2024) indicated that each recall of one hour takes less than two minutes once educators are used to the recording system and is manageable within an educator's working day. The intensive hour technique relies on the sampling theory, which makes it possible to generate an accurate composite picture of what typically happens in a specific occupation, given a sufficiently large pool of randomly sampled data (Bittman 2016). In the present study, respondents were asked to provide information for 20 randomly selected hours over 2 weeks (2 h per 10 working days). The intensive hour technique not only collects data on the allocation of time, it can also provide information about each episode of time: for example, the duration and timing of activities; sequencing of activities; and density of multi-tasking (the simultaneous performance of two or more tasks).

Intensive hour data were gathered via a random-time sampling (RTS) time-use smartphone application (app) (Harrison et al. 2019; Wong et al. 2024). Participating educators downloaded the RTS software onto their smartphones and answered questions about themselves (e.g., position, work qualifications, years of experience) and their workplace (e.g., type of ECEC service: preschool, long-day-care centre). For the following workdays, the RTS software randomly selected two moments, and for each sent a notification asking about the activities the employee undertook in the last hour. The RTS app guides the educator through 10 broad categories of activity (domains), that are further described by a more detailed choice of subtasks (total of 55 subtasks over the 10 domains) (see Table 1). The domains and subtasks were informed by Australia's early childhood national curriculum Being Belonging Becoming: The Early Years Learning Framework for Australia ([EYLF] (Department of Education Employment and Workplace Relations, DEEWR 2009) and are fully explained in the taxonomy of early childhood work (Wong et al. 2015) that is provided to participants.

Educators recorded the amount of time spent in each activity in ten units of 6 min (primary activity). The number of 6 min units provides evidence of the duration of activities. They were then asked if any other activities were completed at the same time and to provide the domain and subtask details for that activity (secondary activity). The inclusion of secondary activities provides evidence of multi-tasking. Educators then answered questions about where the activity took place (indoor playroom; outdoor play area; other) and how many children they were with at the time the activity took place (not with children, individual child, small group of two to five children, large group of six or more children). TUD data entry is then continued until 10 blocks of 6 min (1 h total) are completed.

Table 1. Work activity domains and sub-tasks for early childhood educators and teachers.

Domain	Subtasks
1.Staff personal time	1.1 Scheduled break 1.2. Other break 1.3 Self-care activity/'time-out'
2. Intentional teaching with children	2.1 Problem solving 2.2 Literacy 2.3 Numeracy 2.4 Science/nature 2.5 Social/cultural studies 2.6 Art/craft 2.7 Music/dance 2.8 Media/technology 2.9 Physical/self-help 2.10 Health/wellbeing
3. 'Being with' children	3.1 Watch/scan/supervise 3.2 Play with children 3.3 Listen/respond to children
4. Routine care and transitions with children	4.1 Hygiene 4.2 Nutrition 4.3 Health 4.4 Sleep/rest 4.5 Organise transitions 4.6 Deal with injury/illness
5. Emotional support	5.1 Support positive behaviour 5.2 Mediate conflict 5.3 Comfort child 5.4 Stop unsafe behaviour 5.5 Encourage inclusion 5.6 Other child-related 5.7 Support colleague
6. Family communication	6.1 Individual face-to-face 6.2 Individual email, phone 6.3 Group communication
7. Organise room/OH&S and maintenance	7.1 Set up room/play space 7.2 Pack-up 7.3 Food/meals 7.4 Clean/tidy 7.5 Laundry 7.6 Maintenance/OH&S compliance needs 7.7 Tend to plants/animals
8. Plan/assess/evaluate	8.1 Curriculum planning 8.2 Observe/assess child/ren 8.3 Document learning 8.4 Evaluate
9. Administration	9.1 Record keeping/roll 9.2 Answer phone/door 9.3 Staff handover/communication 9.4 Staff meeting 9.5 Organising staffing 9.6 Other
10. Professional development and support	10.1 Self-educate 10.2 Attend PD/in-service 10.3 Support/mentor others 10.4 Receive support/mentoring 10.5 Pedagogical leadership 10.6 Reflection

Recruitment and data collection extended from June 2017 to June 2020. After data cleaning, activity information was available from 321 respondents for 3610 h that yielded 10,155 episodes of employment-related activities.

Our analysis of work activity data (domains and subtasks) accounted for multiple submission hours collected for the same ECEC educator. Submission hours were not equally distributed throughout the day; therefore, data were weighted by the hour in which the data collection period started. Days of the week were evenly represented across submission hours (Monday to Friday, range = 18% to 21%).

Calculations assessed the mean time allocated to each of the 10 activity domains and each of the 55 subtasks; the distribution of episode lengths (number of 6 min blocks of time per hour); and the proportion of episodes that included a secondary activity (multi-tasking). Differences in mean time allocation to activity domains were tested for statistical significance using regression and analysis of variance F-tests. Analyses were conducted in Stata version 17.0.

3. Results

3.1. Participant Demographics

Demographic information was provided by 304 of the 321 participants. Of these, 54.6% worked in a long day care centre and 45.4% worked in a preschool. The majority of participants (n = 129) held an early childhood education degree, 97 held a Diploma qualification, and 78 held a Certificate III qualification. There was a good spread across the different positional appointments: 116 were employed as teachers, 102 as educators, 40 as room leaders, and 46 as assistants (see Table 2).

Table 2. ECEC participants: descriptive statistics.

Respondent Information	N = 304
Service type	%
- Long-day care	54.6
- Preschool	45.4
Position	%
- Assistant	15.1
- Educator	33.6
- Room leader	13.2
- Teacher	38.2
Qualification	%
- Certificate III	25.7
- Diploma	31.9
- Degree	42.4

3.2. ECEC Work Activities

The TUD records provided by 321 educators were combined to create an 'average working day' that was initially examined by the amount of time per hour that educators spent in each of the 10 domains of work activity. The majority of educators' time (64%) was spent in child-related activities (classified as 'intentional teaching', 'being with children', 'routine care', 'transitions', 'providing emotional support' and 'communications with the child's family'). A further 26% was allocated to organisational and administrative tasks, planning and professional development activities, and 12% to staff breaks (personal time). Figure 1 and Table 3 show the distribution of educators' work time as the average percentage of the day and minutes per hour devoted to each of the 10 domains of work (recorded as the primary activity).

Table 3. Time spent in each domain of work activity. Descriptive statistics.

Work Activity Data (Weighted by Hour in Day)	Minutes M (SD)
Intentional teaching	5.9 (0.4)
"Being with" children	20.3 (0.8)
Routine care and transition	7.5 (0.4)
Emotional support	1.5 (0.2)
Family communication	2.2 (0.2)
Organise room, OHS and maintenance	4.4 (0.4)
Planning, assessment and evaluation	5.3 (0.4)
Administration	3.9 (0.5)
Professional development and support	1.8 (0.3)
Staff personal time	7.2 (0.6)

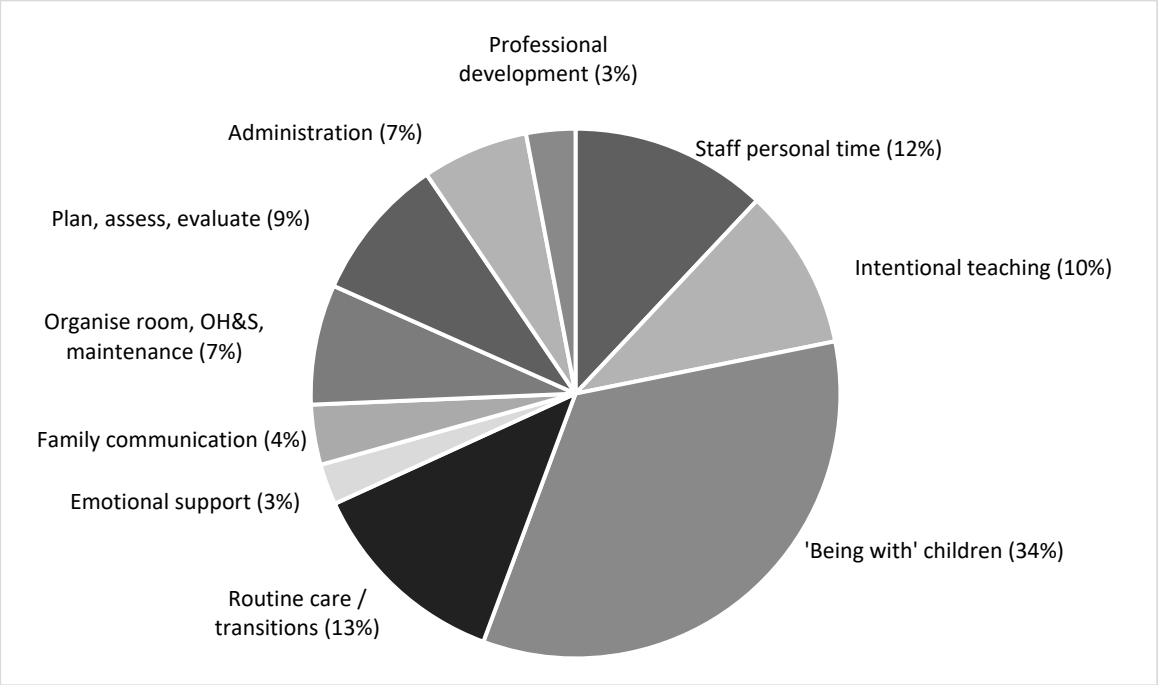

Figure 1. Average percentage of time recorded by educators for each domain of primary activity. Note that percents have been rounded up to the nearest whole number.

In the following sections we present detailed results for each of the 10 employment-related activity domains. For each domain, educators' work is presented in relation to the following:

(a) Time allocated across the subtasks coded for each domain;
(b) Time allocated to each episode (number of 6 min blocks of time);
(c) When the activities are done (hour of the day);
(d) Frequency of multi-tasking (recording of secondary activities) and ranking.

The results for each domain are accompanied by commentary on their significance for the ECEC labour process and contribution to high-quality care and education. We begin with the four child-related activities and communications with the child's family, followed by the four organisational, planning and other work activities, and staff personal time, supported by Table 4. The results for multi-tasking are then presented, supported by Table 5.

Table 4. Time (average minutes/hour) spent in activity domains and subtasks.

Activity Domains and Subtasks	Average Time in Activity Domain	Average Time in Subtask	% Time Spent in Subtask
	Minutes/Hour	Minutes/Hour	%
Intentional teaching	5.9		
Problem solving		0.4	7.2
Literacy, speech, language		1.7	28.2
Numeracy		0.3	4.3
Science, nature		0.8	12.9
Social, cultural, and socio-dramatic		0.5	8.6
Art, craft		0.9	15.2
Music, dance		0.7	12.5
Media, technology		0.1	0.9
Physical, self-help		0.3	5.3
Health and wellbeing		0.3	4.8

Table 4. *Cont.*

Activity Domains and Subtasks	Average Time in Activity Domain	Average Time in Subtask	% Time Spent in Subtask
	Minutes/Hour	Minutes/Hour	%
'Being with' children	20.3		
Watch, scan, and supervise		6.3	30.9
Play with children		10.2	50.4
Listen respond to children		3.8	18.7
Routine care and transition	7.5		
Hygiene		1.4	18.3
Nutrition		2.7	35.9
Health		0.4	5.0
Sleep rest		1.8	24.3
Organise transitions		1.1	15.4
Deal with injury illness		0.1	1.2
Emotional support	1.5		
Support positive behaviour		0.3	18.7
Mediate conflict		0.2	11.5
Comfort child		0.6	43.0
Stop unsafe behaviour		0.1	9.4
Encourage inclusion		0.1	6.8
Other children relate		0.1	5.3
Support colleague		0.1	5.3
Family communication	2.2		
Individual face to face		1.8	78.9
Individual email phone		0.3	12.2
Group individual written		0.2	9.0
Organise room, OHS, maintenance	4.4		
Set up		1.5	34.3
Pack up		1.2	27.9
Food		0.2	5.6
Clean and tidy room		1.1	24.6
Laundry		0.0	0.7
Maintenance OH&S compliance needs		0.2	5.0
Tend to plants and animals		0.1	1.8
Planning, assessment and development	5.3		
Curriculum planning		2.2	40.6
Observe, assess child		0.3	6.3
Document learning		2.3	43.5
Evaluate		0.5	9.6
Administration	3.9		
Record keeping roll		0.7	17.8
Answer phone, door		0.3	8.1
Staff handover communication		0.4	9.2
Staff meeting		0.5	12.5
Organising staffing		0.3	8.7
Other		1.7	43.7
Professional development	1.8		
Self-educate		0.1	6.2
PD in service		0.7	37.5
Support mentor others		0.5	25.3
Receive support mentoring		0.1	2.8
Pedagogical leadership		0.3	13.9
Reflection		0.3	14.3

Table 4. *Cont.*

Activity Domains and Subtasks	Average Time in Activity Domain	Average Time in Subtask	% Time Spent in Subtask
	Minutes/Hour	Minutes/Hour	%
Staff personal time	7.2		
Scheduled break		3.6	50.9
Other break		3.0	41.4
Self-care activity		0.5	7.7
Total	60.0	60.0	

Table 5. Multi-tasking: percentage of time recorded as primary activity only and primary plus a secondary activity.

	Total (Minutes)	% Primary Only	% Plus Secondary	Total %	Rank
Intentional teaching	5.9	36.4	63.6	100.00	2
Being with children	20.3	41.1	58.9	100.00	6
Routine care transition	7.5	36.9	63.1	100.00	3
Emotional support	1.5	27.6	72.4	100.00	1
Family communication	2.2	38.6	61.4	100.00	4
Organise room OH&S maintenance	4.4	39.8	60.2	100.00	5
Plan assess evaluate	5.3	59.4	40.6	100.00	7
Administration	3.9	62.4	37.6	100.00	8
Professional development	1.8	74.9	25.1	100.00	9
Staff personal time	7.2	77.9	22.1	100.00	10
Total	60				

3.2.1. Being with Children

Being with children describes the complementary roles of educators to (1) ensure the safety of children during periods of independent uninterrupted play when educators are not directly interacting with or teaching them; (2) engage with children in their play by following the child's lead, for example by taking on pretend roles; and (3) listen and respond to children's communications, and help or support children to achieve their self-directed learning goals. As such, this domain is aligned with the underlying principle of ECEC and the EYLF and EYLFV2.0 (AGDE 2022): that children learn through play (Brooker et al. 2014; DEEWR 2009). Being with children is essential for educators to develop positive relationships with each child in their care and apply relational pedagogy in their daily practice (Hedges and Cooper 2018). The EYLF emphasises the centrality of secure, respectful relationships in the attainment of children/young people's learning outcomes.

'Being with Children'—as a discretely identified domain—had the largest allocation of time, accounting for a third (34%) of the working day. About half this time (50%) was spent in the subtask 'playing with children'. The next largest share of time in this domain was watching, scanning, and supervising children (31%). The third subtask, listening and responding to children, was reported for 19% of the time. 'Being with Children' was also the activity with the longest episodes, the median being 24 min (4, 6 min blocks). In 14% of the sample hours the episode lasted for the whole hour, although the most frequent episode length (18%) was 12 min, and in 14% of cases it was the minimum length of 6 min. The percentage of episodes longer than 12 min gradually declined up to 60 min. There were variations in time allocation throughout the day. Between 8 a.m. and 10 a.m. was the peak activity time for 'being with children' (averaging 25–26 min per hour). From 11 a.m. to 1 p.m. the time allocation reduced to 17 min per hour, then rose in the afternoon (20 min)

and declined to 17 min by 5 p.m. These variations reflect children's rest or sleep times after lunch, and staff lunch breaks.

3.2.2. Routine Care and Transitions

Items in this domain relate to regular activities associated with hygiene, nutrition, health practices, sleep, and transitioning between activities. Routine care activities offer opportunities for sensitive, stimulating interactions between children and educators (Degotardi 2010). Routine care interactions can enable children's understandings of the mutual interdependence of humans in acts of care, about health and safety, and offer opportunities for decision-making and collaborative activity (DEEWR 2009). On average, 12% of working time was spent in this domain, spread across subtasks of attending to children's nutritional requirements (36%) and sleep/rest (24%), hygiene (18%), and health (6%) needs, as well as dealing with injuries (2%), and organising children's transitions between activities and locations (15%). Episodes were short, involving frequent switching of activities. Many episodes fell within the shortest recordable duration (6 min), 50% lasted less than 12 min, and episode length declined rapidly above this median. Only 3% lasted for the whole 60 min. The time of day strongly influenced time spent in this domain. Between 11 a.m. and 1 p.m. was the peak time for routine care (averaging 13–14 min per hour), while before 11 a.m. the averaged\was only 5 to 6 min per hour.

3.2.3. Intentional Teaching

'Intentional Teaching' captures the mindful manner in which educators create and enact learning experiences with children. As a key component of the EYLF (DEEWR 2009), intentional teaching is described as 'an approach that involves educators being deliberate, purposeful and thoughtful in their decisions and action' (p. 17). Educators are engaged in prior consideration and thoughtfulness, with attention being paid to why particular actions are undertaken. Intentional teaching captures the decisions and the choices educators make in their daily work to make learning experiences happen and to enact the curriculum. Educators allocated an average of 10% of their time to this domain. The largest component was 'literacy, speech, language' accounting for 29% of episodes of intentional teaching'. 'Art/craft' (12%) and 'science/nature' activities (11%) occupied the next largest shares of time, followed by 'music/dance' (9%), 'social, cultural/socio-dramatic' (7%), 'understandings of numeracy' (9%), 'problem-solving' (5%), 'physical self-help' (4%), 'health/well-being' (4%), and 'media/technology' (1%). Episodes of intentional teaching occurred in short bursts: almost 25% were the shortest possible time (6 min); the median was 12 min (indicating that 50% were less than 13 min); and only 5% were more than 30 min. There was a strong diurnal pattern, with more time in the morning peaking at 10–11 a.m., declining hour by hour in the afternoon until it reached 3 min per hour at 4–5 p.m.

3.2.4. Emotional Support

Being attuned to children's emotions and providing support, comfort, and guidance, is a key feature of ECEC educators' work (DEEWR 2009). This includes fostering children's social and emotional understanding to promote inclusion and sensitivity to individual, cultural, and other differences (Blackmore et al. 2016). Ensuring a safe, trusting environment for play and learning (Page 2018) also extends to educators' obligations to their colleagues. On average, 2.5% of the day was devoted to this activity. Of the subtasks, 43% of this time was spent 'comforting a child', 19% supporting positive behaviour, and 12% mediating conflict. The remaining 27% was distributed equally across the other four subtasks: stopping unsafe behaviour; encouraging inclusion; supporting a colleague; and other child-related matters. These activities tended to be brief. The median episode length was 6 min, and 18% were above 12 min.

3.2.5. Family Communication

This domain of activity relates to educators' communication with children's families, which can take the form of in-person discussion, emails, newsletters, and online documentation. The EYLF (DEEWR 2009) emphasises the importance of early childhood programmes respecting and acknowledging families as 'children's first and most influential educators', the centrality of relationships with families to children's sense of belonging, and the capacity of the early childhood programme to appropriately reflect and consider the family and community context of each child. Typically, educators will have brief conversations with families at drop-off and pick-up time. However, services might also supplement these conversations with longer scheduled discussions with families, and digital or email updates informing families of children's activities. Results showed that educators spent 4% of their worktime interacting with families. Most of the activity was face-to-face (79%), with 12% in communication by phone, and 9% spent in written group or individual communication. The median episode length for family communication was 12 min, 92% were under 30 min. Most episodes of family communication were clustered by hour of the day, with twice as much time given to these tasks first thing in the morning (7 a.m.–9 a.m.) and late in the day (3 p.m.–6 p.m.).

3.2.6. Organise Room, Occupational Health, and Safety Maintenance

This domain concerns the configuration of the learning environment and ensuring that the environment is hazard free for children and adults. Areas need to be set up with appropriate furniture and equipment to ensure an engaging learning environment for children. For example, the EYLF (DEEWR 2009) advocates promoting 'small group interactions and play experiences' for children. Regular tidying and cleaning of equipment is required to minimise the risk of injury and cross-infection, for both children and adults. Educators spent time 7.3% of their worktime in this domain, with just over a third (34%) of this time setting up the play space and equipment, and 28% packing it away. The remaining tasks were cleaning and tidying (25%), mealtimes (6%), maintenance/industrial compliance (5%), tending to plants and animals (2%), and laundry (1%). The median duration was 12 min, only 39% of episodes were shorter, and 16% took 30 min or longer. The peak times of day for the activities in this domain were 7 a.m.–8 a.m. and the late afternoons.

3.2.7. Planning, Assessing and Evaluating

This domain relates to planning for, documenting and assessing children's learning and development (Barblett et al. 2021). Planning, assessing, and evaluating is the foundation of early childhood curriculum. It also forms the basis of communication with families and, where children's development/learning is atypical, referral for early intervention advice and support. In ECEC, curriculum planning occurs in a continuous cycle (ACECQA 2019), both for individual children and for groups. Educators are entitled to a minimum of two hours non-contact time per week for this task under the Children's Services Award 2010 (Australian Government Fair Work Ombudsman n.d.b). Results showed that, on average, 9% of educators' time related to these regulatory requirements for curriculum planning, assessing children's progress, and evaluating the effectiveness of the ECEC programme. Of this, 44% was allocated to documenting learning, 41% to curriculum planning, 10% to evaluation, and 6% to observing and assessing children. The median episode duration was 18 min, and 30% lasted for 30 min or longer.

3.2.8. Administration

This domain includes the daily tasks that ensure the centre runs smoothly, operates efficiently, and complies with legislated requirements (Waniganayake et al. 2017). Administrative tasks come under the umbrella of management (Rodd 2013), but leadership and management are inextricably linked for the optimal operation of the centre. Only a small proportion of time (6.5%) was spent on administration. Just over half of this time was allocated to subtasks of record keeping (18%), staff meetings (13%), staff handover (9%),

arranging staffing (9%), and answering the telephone or the door (8%), with the largest proportion (44%) in 'non-defined/other tasks'. The median duration for an episode was 18 min, and activities lasted the whole hour in 15% of cases. Administration was more likely to occur early in the day.

3.2.9. Professional Development

This domain of activities relates to learning and support activities that enhance educators' professional development, including both receiving, and/or providing others with, support. On-going professional development of educators is essential for the provision of high-quality early childhood education (Egert et al. 2018). Professional learning and support activities within ECEC are varied and can include both formal and informal activities and can occur both within, or external to, the service (Schachter et al. 2019). Examples of typical formal professional development activities are the induction and training of new staff, and attending professional development training (e.g., courses, seminars, symposia, conferences). Examples of informal activities include self-education (e.g., reading professional materials, publications, journals and texts), and mentoring and coaching (e.g., support, advice and guidance from colleague/s). On average, 3% of educators' time was allocated to professional development. Professional development through attending an in-service course had the largest share (38%), followed by supporting and/or mentoring others (25%), providing pedagogical leadership (14%), reflection 14%), self-education (5%), and receiving support/mentoring (5%). The most frequent duration was 60 min (the whole sampled hour). The median was 30 min, thus 50% of episodes lasted between 30 and 60 min.

3.2.10. Staff Personal Time

This domain records times when educators are not engaged in child-related activities. It includes meal breaks, additional breaks (answering phone calls, taking a toilet break), and being out of the classroom for other personal reasons. In Australia, registered agreements (e.g., industrial awards) prescribe breaks employees are entitled to under that agreement (Australian Government Fair Work Ombudsman n.d.a). However, in practice early childhood educators may not be able to take all the personal time they are entitled to (United Workers Union 2021). Many feel they must 'get back to the children'; others cannot take breaks as staff shortages mean they cannot leave classrooms without breaching mandated staff/child ratios. 'Staff Personal Time' accounted for 12% of staff time and was composed of scheduled breaks (51%), breaks for self-care, e.g., eating, grooming, toilet breaks (8%), and other breaks (42%). Breaks were typically very short; 24% were recorded for episodes of six min, and only 25% lasted for one hour. The median break duration was 12 min. Although staff took breaks in short intervals during the day, they had a lunch break of about 45 min. Breaks were longer around lunchtime, between 12 noon and 2 p.m. However, apart from the scheduled lunch breaks, short periods of 'Staff Personal Time' were twice as frequent at the start of the workday (7 a.m.–8 a.m.) and longest at the end of their working day (4 p.m. to 6 p.m.).

3.3. Multi-Tasking

Results for multi-tasking are presented for each domain in Table 5. The average total time (mean minutes) spent in each domain is separated into the percentage recorded as a primary activity only and the percent recorded as with an additional secondary activity. The final column provides the ranking (1 to 10) of multi-tasking, from highest to lowest percent. Analyses showed that all work activities had some level of multi-tasking, ranging from 72.4% to 22.1% of the time spent in work activities in each domain. Secondary activities could be from the same domain (e.g., for a different subtask) or a different domain.

The top-ranking domain for multi-tasking was providing emotional support. Educators reported undertaking a 'secondary' activity in conjunction with providing emotional support in three-quarters (72.4%) of episodes. The most frequent combinations, in descend-

ing order of magnitude, were the following: 'being with' children; providing 'emotional support' with another child; and 'routine care and transitions'. This was followed by intentional teaching and routine care, ranked 2nd and 3rd for multitasking, with educators reporting undertaking another activity in 63.6% and 63.1% of episodes. For both these domains, the most frequent combinations were the following: 'being with' children, intentional teaching and routine care. The next ranked domain (4th) was communication with families, which was accompanied by another activity 61.4% of the time. Again, the most frequent combinations were the following: 'being with' children, emotional support, and routine care. A similar level of multi-tasking (60.2%) was recorded for organise room/OH&S/maintenance, ranked fifth highest. The most frequent combinations, in descending order of magnitude, were the following: 'being with children', organise room/OH&S, and plan, assess, evaluate. 'Being with children' was the lowest ranked child-related domain for multi-tasking (6th of 10, at 58.9%), recorded in combination with 'being with' children, routine care and intentional teaching.

A lower level (<50%) of multi-tasking was recorded for the remaining work activities and staff personal time. Plan, assess, evaluate (40.6%) ranked seventh for multi-tasking. These activities were completed in combination with: plan, assess, evaluate, administration and 'being with' children. Administration (37.6%) ranked eighth, recorded along with other administration tasks, family communication, and planning. The domain for professional development at 25.1% was the second lowest rank (ninth out of ten) for multi-tasking, but occurred in combination with professional development, administration, and 'being with' children. Staff personal time (22.1%) was the lowest-ranking domain for multi-tasking, but when recorded, it overlapped with all of the other activity domains, with 'being with' children' reported as the most typical secondary activity.

4. Discussion

In reviewing the results for these 10 domains of ECEC work activity, it is striking that all educators, regardless of qualification, participated in all 10 work domains, and within these, a wide range of different subtask activities. The distinctive characteristics of the ECEC labour process are seen in the following: (a) the sheer variety of tasks; (b) the short duration of tasks that demand rapid switching; and (c) the overlapping combination with other tasks. Rapid switching combined with the high proportion of time when multiple tasks were performed simultaneously requires great cognitive agility. This cognitive load is compounded by responsibility for groups of children, which divides attention even further. In this study, participating educators were responsible for groups of children for 68% of their working day (22% with 2–5 children; 46% with 6 or more children). An additional 9% was spent in one-on-one work with a single child. This level of responsibility for very young children is high and likely contributes to the constant switching of activities and the proportion of working hours requiring attention to more than a single task. Notably, 'being with' children was recorded as a secondary activity for all ten domains, including domains 'Administration', 'Planning', and 'Staff Personal Time'.

Experimental studies suggest that rapid switching of tasks or performing more than one task at a time, especially if tasks are complex, impedes productivity. These experiments compare how long it takes for people to repeat a single task with how long it takes when there are two tasks involved. Rogers and Monsell (1995) showed when people had to switch between two tasks, even when this was predictably regular, they were still slower on task-switch than on task-repeat trials. Meuter and Allport (1999) showed that even switching to the more habitual of two tasks can be slower, while Rubinstein et al. (2001) found that participants lost more time as tasks became more complex or were less familiar, but were faster when they switched to tasks they knew better. Courage et al. (2015) also note that task rotation may also incur 'switch costs' (p. 10) when tasks are changed more quickly, and Monsell et al. (2000) note that resolving potentially conflicting requirements during the process of undertaking the task can also decrease efficiency.

Yeung and Monsell's (2003) subsequent work highlighted key issues that need to be addressed to improve our understanding the cognitive load imposed by real-life multi-tasking in ECEC. They note that in addition to reconfiguring control settings for a new task, one is also obliged to recall where you got to in the task to which you are returning and to decide which task to change to, and when. As Meyer and Kieras (1997a, 1997b) explain, the time costs of switching tasks or performed two tasks at the same time derive from the cognitive processes of (1) goal shifting, e.g., "I need to do this activity now instead of the activity I am currently doing" and (2) rule activation, e.g., "I am turning off the rules of my previous activity and turning on the rules for newly demanded activity".

The findings of this body of experimental research are closely aligned to qualitative research into the day-to-day work of ECEC. Multi-tasking and rapid task switching has been described by educators as involving constant decision-making, often being on 'high alert', feeling pulled in many directions, and coping with incomplete tasks (Cumming et al. 2024; McFarland et al. 2022). The characteristics of ECEC work identified in this paper—(a) the number of episodes per hour; (b) the proportion of an hour involving multi-tasking; and (c) the proportion of an hour with responsibility for six or more children—are factors that are emotionally demanding and may contribute to high turnover, leading to labour supply difficulties in the ECEC sector.

Yet, we note that for these high-quality ECEC settings, staff reported a high degree of job satisfaction and low degree of stress: 87.6% of responses to the question 'How satisfied did you feel?" were positive, with half (50.7%) of working hours rated by educators as being 'very satisfied'. At the same time, 68.5% of responses indicated low levels of stress (Harrison et al. n.d.). We hypothesise that the demands of task rotation and multitasking are somewhat mitigated by the fact that these are high-quality centres in which educators report feeling valued and supported. We would not expect to see this pattern across the sector, especially those services that are characterised by a high degree of staff turnover. The issue of quality, therefore, is also integral to the consideration of productivity. It is high-quality services that contribute most to positive outcomes for children, while also being interwoven with job satisfaction for staff (Gibson et al. 2023).

The use of the intensive hour time-use diary technique yields detailed data about the ECEC labour process and the organisation of ECEC work. It reveals that the outstanding characteristics of this occupation are the rapid switching of tasks and the juggling of the many expectations and demands. The variety of tasks undertaken occurs for all educators, regardless of qualification. Most of the educators' time involves direct engagement with children, described in this paper by four specific activities—being with children, routine care/transitions, intentional teaching, emotional support, plus family communication which is typically conducted face-to-face at arrival and pickup times when children are present. The findings around rapid switching of attention and multi-tasking (divided attention) suggest ECEC work involves a heavy cognitive load requiring advanced skills. So, in addition to under-recognised skills around 'emotional labour' (Humphrey 2021; Findlay et al. 2009; Steinberg and Figart 1999) and the associated lack of monetary rewards (Budig et al. 2019) that have been associated with childcare work, one can add the (unacknowledged) skills of constantly coping with seriously divided attention.

Returning to Baumol's theory and the question of productivity, it is not clear how the wide variety of relatively short duration tasks, typical of ECEC work, could (or should) be divided among separate educators. Additionally, reducing the number of educators in an effort to increase productivity along the lines of traditional economic theory would likely result in increased demands to task switch and multitask for the remaining educators in ways that would have a deleterious impact on the quality of experiences for children. In turn, a downturn in quality would result in poorer outcomes for children, as it is the quality of ECEC that supports positive experiences for children in the present and positive outcomes over time.

We argue that in these high-quality settings, the labour itself is the product, as is the high quality of ECEC, which in turn produces what is better for children in the present

and in the future. Moreover, when a child becomes an adult, their valued capabilities and good functions are available to all employers, to the state as taxpayers, to intimates as good spouses and civil society as good citizens. In this sense, they are 'public goods' (Folbre 1994).

As studies of non-parental care have shown, a major effect of commodified care is not to substitute for mothers' parental care, since this is barely diminished by long hours of non-parental care (Bittman et al. 2004) but is for the mobilisation of families' participation in the paid labour force. This mobilisation depends upon the availability, access, quality and cost of non-parental ECEC. However, the cost of providing good quality ECEC can price families out of the market, including those that work in ECEC (Himmelweit 2007; Adema et al. 2016; Petitclerc et al. 2017). Yet, the reduction in labour or the suppression of wages as a means of reducing cost is not feasible if the quality of care and education children receive is to be prioritised, and if the skill and complexity of the work is also to be recognised. As economies such as Australia's transition away from employment in manufacturing to employment in providing services, traditional economic framings of cost containment through increased productivity may not be appropriate. Our research, conducted in high-quality ECEC services, draws attention to the advanced cognitive skills required in the ECEC labour process underlining the need for greater societal recognition and reward.

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Notes

1 The time Australian parents devote to childcare is much greater than time in any branch of paid labour (Ironmonger 2004, p. 104).

2 The United States Bureau of Labor Statistics (2022) projects that, between 2020 and 2030, six of the ten fastest-growing occupations will be in the care sector. The rate of growth does not automatically translate into the total numbers of jobs created. For example, employment in 'software developers and software quality assurance analysts and testers' is projected to generate 2.8 times fewer jobs than 'home health and personal-care aides'.

3 Author 2's own calculation derived from Bureau of Labor Statistics. Occupational projections and worker characteristics (https://www.bls.gov/emp/tables/occupational-projections-and-characteristics.htm, accessed 27 April 2022).

4 Long-day-care in Australia refers to early childhood centres providing education and care for children birth to five (school age) for up to 52 weeks of the year, and open minimum eight hours per day.

5 The Australian Children's Education and Care Quality Authority (ACECQA) (www.acecqa.gov.au) (accessed on 13 November 2024) is the independent national authority that assists the Australian and state and territory governments in administering the National Quality Framework (NQF) (https://www.acecqa.gov.au/nqf/about) (accessed on 13 November 2024)) and National Quality Standard (NQS) for children's education and care services.

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