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To cite this article: Lee-Ann Ewing & Holly B. Cooper (2021): Technology-enabled remote learning during COVID-19: perspectives of Australian teachers, students and parents, Technology, Pedagogy and Education, DOI: [10.1080/1475939X.2020.1868562](https://doi.org/10.1080/1475939X.2020.1868562)

To link to this article: <https://doi.org/10.1080/1475939X.2020.1868562>



Published online: 02 Feb 2021.



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Technology-enabled remote learning during COVID-19: perspectives of Australian teachers, students and parents

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ABSTRACT

The majority of Australian students learned remotely in term two (April–June 2020), in response to state government directives to close schools during the ‘first wave’ of Covid-19. This created myriad challenges for students, teachers and parents. Accordingly, this study seeks to capture these multiple perspectives of the remote learning experience. Forty interviews were conducted at the end of term two, with students, teachers and parents. The findings represent an integrated framework for engagement in the context of remote education. Engaging students was a top priority for teachers – albeit students felt less engaged with teachers. Student–peer engagement varied considerably. Lack of social interaction was a challenge for many students. Parents remained pragmatic, but largely unengaged with teachers. For the most part, students found online learning to be less personalised. While the pandemic has expedited emergency technology adoption in schools, this is not equivalent to the purposeful integration of technology over time.

ARTICLE HISTORY

Received 30 July 2020
Accepted 5 December 2020

KEYWORDS

Remote learning; challenges; technology; engagement; individualisation

Introduction

The Australian education system, and indeed the world, faced a *new* challenge in 2020. The Covid-19 pandemic forced many of those attending traditional schools to learn remotely. Most teachers have been trained in traditional methods and thus lacked the necessary skill set for shifting into a distance learning mode (Archambault & Crippen, 2009; Chen et al., 2018). Indeed, some of the challenges presented by the pandemic-driven school closures are consistent with those of remote education, such as adequate accessibility to supportive resources, too few teachers specifically trained to provide a high-quality online experience, student isolation and difficulty engaging students (Moore-Adams et al., 2016). Educational activities during emergency contexts could provide what Burde et al. (2017, p. 619) described as ‘structured, meaningful and creative activities’ that improve emotional and cognitive well-being in students.

Australia is a vast and diverse continent. The tyranny of distance has long governed education in Australia’s remote communities. Extreme weather, isolated cattle stations, distributed populations and boundless distances represent persistent challenges to the delivery and equality of education in Australia. These conditions have necessitated the development of unique approaches and inspired perpetual innovation in education delivery. Explicably, Australia has a rich history of remote education (Hidetoshi & Suk Ying, 1993). Indeed, as early as 1951, Australia launched the world’s first ‘School of the Air’, bringing education to Australia’s ‘outback children’ (‘World’s First School of Air Opened,’ 1951). Such innovations were revolutionary and marked a turning point in equality of access to

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education. Yet, the extent to which Australia's remote learning heritage has prepared it for a pandemic remains unclear, especially in densely populated metropolitan areas.

By April 2020, schools had been suspended in 189 countries in response to Covid-19, affecting 89% of learners globally. By June, this figure had risen to 98.5% (UNESCO, 2020). On 1 March 2020, Australia reported the first Covid-19 fatality (ABC, 2020), leading to the closure of international borders to all non-residents on 20 March (Burke, 2020). Social distancing rules were imposed on 21 March, and the state governments started to close 'non-essential' services thereafter. As of 16 October, 27,362 confirmed cases of coronavirus had been reported in Australia (boosted by a significant 'second peak' almost entirely restricted to the state of Victoria in July–September) and 904 fatalities (Department of Health, 2020). Consequently, education was conducted almost exclusively in a remote context in term two (April–June 2020).

Thus, the purpose of the current study was to develop an integrated framework of remote learning engagement. Accordingly, we explore the experiences of Australian students, teachers and parents with remote learning during the so-called 'first wave' (March–May 2020). The remainder of this manuscript is structured as follows. First, the relevant literature is reviewed, on remote and distance forms of education. Next, we detail the methodological approach. Then, we present the findings before addressing the limitations and implications of the study.

Literature review

Urban research predominates the educational research domain (Butler et al., 2014; Fung et al., 2017; Ritzhaupt et al., 2008). Nevertheless, remote and distance education represent burgeoning areas of academic inquiry (Bernard et al., 2009; Heradio et al., 2016; Huang et al., 2010; Hurd, 2006). Remote educational theory has, in accordance with practice, developed in parallel with technology (Bates, 1997; Bernard et al., 2009; Sahin & Shelley, 2008; Turvey, 2006). The foundational premise is educational equity, regardless of situation, circumstance or geographic location (Stenman & Pettersson, 2020; White, 2005). The literature, however, is fragmented across the disciplines of education, psychology, sociology and technology, with little consistency in terminology (Holmberg et al., 2005; Rice, 2006; Tallent-Runnels et al., 2006). Policies and practices, perhaps consequently, typically reappropriate traditional methods to evaluate the quality of education (Holmberg et al., 2005; Rice, 2006), which fail to capture the unique complexities and approach necessitated by remote education. Indeed, many use distance, remote, online and virtual schooling interchangeably. Albeit distinct forms of education, they are not discordant. Rather, we posit that they form a continuum, one that is governed by the degree of autonomy and integration of technology.

Notwithstanding, for the purposes of this study we define remote education as equal and inclusive education where students and teachers are geographically rather than temporally separated (Stenman & Pettersson, 2020). In contrast, distance education is characterised by independent study and student autonomy (Elaine, 2011). However, empirical studies of remote education are limited and even more so in crisis contexts. Thus, it was pertinent to draw upon the sphere of distance education in developing a theoretical foundation for the research into remote learning experiences. Distance-based educational theory has developed in parallel with technology (Bates, 1997; Bernard et al., 2009; Sahin & Shelley, 2008; Turvey, 2006).

The literature divides into two overarching, yet overlapping, streams of adult distance education and child distant learning. Studies in the first stream centre on comparing traditional classroom-based instruction with distance education outcomes (Bernard et al., 2009), identifying the implications of and access to emergent technologies (Bates, 1997; Chen et al., 2018; Kember, 1989), such as mobile devices on underprivileged indigenous populations (Auld et al., 2012) or perceptions of distance education among adult learners (Hurd, 2006; Sahin & Shelley, 2008; White, 2005). However, as Bernard et al.'s (2009) meta-analysis of the experimental literature on distance education notes, studies typically lack methodological rigour and the 'very nature of the question' (how does distance education compare with classroom instruction?) 'impedes our ability to discover what makes'

distance education 'effective or ineffective' (Bernard et al., 2009, p. 1245). Moreover, the vast majority of empirical studies address adult rather than adolescent learning (Rice, 2006). These, arguably, have limited salience in the context of primary and secondary education, for children have fundamentally different learning needs to adults.

The second stream is scant in comparison. Indeed, as Rice (2006) noted, although research on the experience of high school students is limited, that which examines the distance educational experience of primary school students is even scarcer. Child learning comprises complex and dynamic psychological processes that are foundational to the development of socio-emotional and intellectual capabilities (Steinberg, 2005). Learning outcomes are underpinned by the instructional approach, individuals' memory structure and their information-processing capacity (Rice, 2006; Schneider & Löffler, 2016). As such, the development of instructional scaffolds that support cognitive development and functioning of primary and secondary students is essential and an important avenue of research going forward. Indeed, the educational approach for primary and secondary distant education must be distinct from distant adult education, just as traditional schooling methods diverge from that of higher education.

Those that examine K–12 (i.e., kindergarten to Year 12) distance education, as with the adult-oriented literature, centre on comparison with traditional schooling methods (Holmberg et al., 2005; Rice, 2006). They highlight that rural and remote communities experience shortages in regards to teaching staff or instruction materials, in turn hindering learning (Sullivan et al., 2013). Others examine the reciprocal relationship facilitated by interactive technology (Cavanaugh, 2001; Richmond et al., 2000; Turvey, 2006). However, pedagogical issues remain, and a framework for either primary or secondary education is wanting. Furthermore, an understanding of engagement in the context of remote education is absent.

Theories of engagement

Two theoretical frameworks, although not particular to remote education, represent a starting point to understanding stakeholder engagement in a remote learning context during a pandemic. We examine each of these in turn.

The first is Moore's (1973) theory of independent learning and teaching. Moore's (1973) theory can be captured in three continua: high dialogue–low dialogue; highly individualised–less individualised; and least distant–most distant. Central to the theoretical framework is the notion that peer, teacher and parent engagement will in turn maximise student engagement. By its very nature, video telephony is high dialogue, low distance. However, the degree to which it is perceived to be *individualised* in the context of Australian remote teaching during a pandemic is yet to be established.

The second is with Borup et al.'s (2014) community of engagement framework. Borup et al. (2014) identified four types of engagement (student engagement, teacher engagement, parent engagement and peer engagement) and considered how these might influence students' affective, behavioural and cognitive engagement. They went on to identify three primary indicators of teacher engagement: facilitating interaction, designing and organising course materials and timelines, and instructing students. 'Although parents and teachers have distinct roles in students' education, they have overlapping influences on student engagement' (Borup et al., 2014, p. 128; Epstein & Dauber, 1991). Peers' responsibilities to improve other students' engagement are of a different nature and intensity than those of parents and teachers. Borup et al. contended that peer engagement is primarily made up of two elements: *instructing/collaborating* and *motivating*. The framework as a whole suggests that the degree to which students engage in learning activities will be influenced by parent, teacher and peer engagement and interactions (Borup et al., 2014). Specifically, within the context of the present study, engagement refers to students' perceptions of their engagement with their teachers, peers and with their remote learning experience; teachers' perceptions of their engagement with students; and parents' perceptions of their engagement with teachers.

However, the extent to which this framework is applicable in a remote learning context is unclear. The extant research suggests that, as unique situations, crises necessitate a specialised educational approach. Therefore, a focal question addressed in this study is how did students, parents and teachers engage with remote learning (and each other) during the Covid-19 pandemic?

Research design

The study of stories is pertinent to understanding the psychological complexities of educational experiences. Examining the collective memories that constitute an individual's narrative can provide rich insight into the production, construction and management of meaning (Fiese & Spagnola, 2005; Fivush, 2008). Narrative inquiry enables insight into the intricacies embedded in accounts of the individual's lived experience (Ollerenshaw & Creswell, 2002; Polkinghorne, 2007). The strategy is particularly valuable when examining relational signifiers, individual meaning structures and collective value systems (Richmond, 2002; Smith & Sparkes, 2006). Thus, it was suitable in this study's examination of the direct, indirect and unintended influences on learning experiences of students, teachers and parents during the Covid-19 pandemic in Australia.

Data collection

Narrative discourse communicates worthwhile and thoughtful knowledge; while the form of this knowledge differs, it can be elicited through either spoken, written or visual modes (Smith & Sparkes, 2006, 2017). For the purposes of this study, the method of eliciting appropriate narrative data is based on semi-structured interviews via email with 15 students, 12 parents and 13 teachers.

Interviewees were purposively selected, in accordance with Marshall (1996), on the basis of their direct experience with remote education during the situational context of the pandemic. The first author's personal insight, as both teacher and a parent of a Year 12 student during lockdown, proved critical in the development of selection criteria that governed the inclusion of informants.

See Tables 1-3 for a full description of the study participants and their profiles. As per Table 2, there is a bias towards senior students in years 11 (5) and 12 (6), with only four students in years 5, 7, 9 and 10.

An interview protocol promoted consistency of insight and served the purpose of steering the interviews. Moore's (1973) theory of independent learning and teaching and Borup et al.'s (2014) community of engagement framework informed the interview protocol. The protocol encouraged respondents to draw upon 'their own linguistic frameworks in describing incidents'

Table 1. Teachers (13).

Pseudonym	Gender	Age	Year taught	School type	State
Jodi	F	62	4	Catholic	WA
Hannah	F	25	1	State	WA
Justine	F	65	2	Special needs	VIC
Eve	F	27	2	Catholic	VIC
Jane	F	28	¾	Catholic	VIC
Gill	F	61	Foundation	Catholic	VIC
Gary	M	50	4	Independent	VIC
John	M	30	10-12	State	VIC
Jill	F	60	10	State	VIC
Caryn	F	58	7-9	State	VIC
Dawn	F	56	10-12	Independent	VIC
Derek	M	53	10-12	State	VIC
Gabe	F	49	EA	Independent	VIC

Note. EA = Education Assistant; WA = Western Australia; VIC = Victoria.

Table 2. Students (15).

Pseudonym	Gender	Year	School type	State
Richard	M	12	Independent	VIC
Craig	F	12	Independent	VIC
Kate	F	12	State	VIC
Jane	F	10	Independent	QLD
Steve	M	12	Independent	VIC
Ted	M	11	Independent	NSW
Nel	F	11	Catholic	VIC
Lance	M	12	Independent	VIC
Lyle	M	12	Catholic	VIC
Alice	F	5	State	NSW
Virginia	F	11	State	VIC
Tessa	F	11	Catholic	NSW
Sally	F	9	Catholic	NSW
Shaun	M	7	State	VIC
Nathan	M	11	Independent	VIC

Note. VIC = Victoria; QLD = Queensland; NSW = New South Wales.

Table 3. Parents (12).

Pseudonym	Gender, age	Child year (gender)	School type	State
Billi	F, 47	Prep (M)	Independent	VIC
Neil	M, 47	12 (F)	Independent	VIC
George	F, 49	9 (F)	Independent	VIC
Beth	F, 52	7 (M)	State	VIC
Sally	M, 52	3 (F)	Catholic	VIC
Michaela	M, 52	10 (F)	Catholic	NSW
Arthur	M, 52	5 (F)	State	NSW
Will	M, 65	7 (M)	State	VIC
Darcy	F, 55	11 (F)	Catholic	VIC
Mark	M, 52	12 (M)	Independent	VIC
Alan	M, 52	12 (M)	Independent	NSW
Trish	F, 40	11 (M)	Independent	VIC

Note. VIC = Victoria; NSW = New South Wales.

within their life story (Stern et al., 1998, p. 197), thus eliciting descriptions about the lived experiences during the pandemic. Given most students' lack of (pre-Covid) experience with platforms such as Microsoft Teams and Zoom, computer/technological expertise in the context of distance education and student satisfaction (Sahin & Shelley, 2008) is also incorporated in the research questions. Specifically, interview participants were asked to describe:

- their degree of engagement with teachers, peers and parents (Borup et al., 2014);
- their confidence and competence with technology (Sahin & Shelley, 2008);
- the degree of individualised attention they received in a remote compared to traditional learning context (Moore, 1973).

Please refer to [Appendix A](#) for the full interview protocol – which was customised to each of the three groups.

Interviews, albeit a tool for eliciting rich data (Ronkainen et al., 2016; Tamminen & Bennett, 2017; Walsh et al., 2018), are susceptible to the common problems of bias, poor recall or inaccurate articulation (Shankar & Goulding, 2001; Smith & McGannon, 2017). To protect the quality of evidence, all respondents responded in writing (email), providing a more accurate rendition of each individual's accounts.

Data analysis

In accordance with Braun and Clarke (2006 p. 78), the research process involved multiple iterations and multiple levels of analysis (Fiese & Spagnola, 2005) namely coding generation, pattern matching, review, defining themes and re-storying.

Iterative readings of the text involved moving back and forth between the parts of the whole, searching for meaning and analytic patterns (Braun & Clarke, 2006; Gadamer, 2008). Significant features of the text were coded in a 'systematic fashion across the entire data set' (Braun & Clarke, 2006, p. 87). Of special interest were narrative congruence, narrative interaction and relationship beliefs (Fiese & Spagnola, 2005).

After discerning and exhaustively coding the thematic and structural aspects of the text, analysis entered the analytic stage of pattern matching, which involved re-focusing the analysis by moving away from key words towards greater themes. In this search for themes more broadly, different codes were sorted into potential themes, and relevant coded data extracts were collated within the identified theme. These themes, as part of a constant comparative method, were compared with existing theory (Glaser & Strauss, 1967). We sought verisimilitude rather than exact truth 'examining the underlying insights each story illustrated and capturing these complexities through narrative reconstruction' (Webster & Mertova, 2007, p. 4). The iterative, inherently dialogical approach challenged the emergent theoretical argument and built on the theory of remote engagement. We sought to capture the lived experiences through rich detail about contextual thematic elements including problems, characters actions and resolution.

Four qualities of narrative coherence were considered: internal consistency, organisation, consideration of multiple viewpoints and the relative congruence between actions and expressed thoughts (Fiese & Spagnola, 2005). Narrative coherency was 'tempered with a sensitivity to differences, both subtle and significant, that differentiated "the individual stories" that comprise the overarching ... narrative' (Hirschman, 1986, p. 245; Polkinghorne, 1988, 2007; Webster & Mertova, 2007). Through these explicit strategies we attempted to affirm the quality and integrity of the research. The findings present a theory of educational engagement in remote learning contexts.

Findings

Consistent with the theoretical framework, findings are presented according to students' engagement with teachers, peers and parents (Borup et al., 2014); the degree of individualised attention they received remotely (Moore, 1973); and their confidence and competence with technology (Sahin & Shelley, 2008).

Relational facets of engagement

Teacher–student engagement

The engagement of students was a central priority for teachers. For many, this took priority over curriculum. Teachers explained that 'that our main concern was keeping them connected'. Yet, engagement concurrently represented their greatest challenge. For digitally native students were adept at feigning connection without engaging in actuality: 'It was hard though as some did not attend and even though I emailed them, really there was no consequence to their accountability' (Dawn, Y10–12 independent). Dawn went on to note that students are 'astute electronically and obviously texting whilst listening'.

Thus, while teachers viewed technology as a tool for connecting with students, it also represented a constraint in achieving authentic student engagement. As a teacher, this is challenging. 'Some students chose not to activate their video so you could not see what they were up too. Hard to control this' (Dawn).

Albeit important, connection does not equate with engagement; rather, it is a prerequisite for the latter. Indeed, engagement was a complex, multifaceted concept that was difficult to manage in the context of remote learning:

students who lack confidence, are not self-motivated or have poor organisation skills struggle to purposefully engage in this environment. There are also complexities surrounding re-establishment of friendships and social issues arising out of re-integration of younger students back to school. (Gabe, EA independent)

One means by which teachers sought to manage and mitigate duplicitous engagement was by establishing expectations and around attendance and behaviour. Students were 'expected to participate [in classes online] from a "living" room in their home, rather than their bedroom, and to be dressed appropriately (not in their pyjamas)' (Jill, Y10 state). To cope with the challenges of engagement, teachers drew on school leadership for support. Leadership, moreover, played an important role in establishing an effective online culture in the school:

my principal was very active in 'setting the tone'. From the 'get go' it was important that we had high expectations from the students, so that they could see that we were taking their learning during this time seriously. (Eve, Y2 Catholic)

Dawn concurs with this sentiment: 'great support from executive ... consistent system established'. Derek, a state secondary school teacher, noted that:

the tone was set a great deal by the school, out of 5 periods a week the students had to attend the 2 double lessons ... roll was marked randomly twice through the lesson to ensure students had not just logged on and walked away ... the tone was difficult to police.

Certain groups of students responded well to the online learning platform. Indeed, many students preferred this type of engagement, albeit the learning context compounded difficulties for those already struggling in a traditional schooling context:

students who would normally find school difficult, whether it was engagement, school rules, personality clashes, not a lot could be done to engage them. I found this a lot with my year 10 students. My communications with some of my colleagues was very similar. (Derek)

Engagement was dichotomous. Presence did not equate with engagement. Students were adept at maintaining presence while engaging with other online activities. Teachers, albeit invested in the engagement of students, were not equipped beyond the traditional means of management and monitoring.

Student-teacher engagement

The degree to which students engaged with teachers online varied considerably; however, three pillars of student-teacher engagement emerged: interest, effort and boundaries. From the perspective of the student, interest was foundational to engagement. To achieve student engagement, lessons first and foremost necessitated intrigue or at the very least aroused the curiosity of students:

Shaun (Y7 state) felt that he was not engaged with the teachers at all:

It was really boring. There were no boundaries. I could play games on my phone during class and the teacher couldn't see to stop us which he would do in F2F classes.

Boundaries, in turn complemented interesting lessons, forming a framework that supported engagement.

Most students were encouraged to email their teachers. Students did use this avenue, but some found it time-consuming. Lyle (Y12 Catholic) felt that emailing teachers was easier and more efficient, 'rather than at school trying to find where they [teachers] are'. Other students noted the frequency of their online interactions with teachers:

4/5 of my teachers did a call on Microsoft teams almost every class. (Kate, Y12 state)

The teachers directly interacted with students by calling on them to answer questions. (Lance, Y12 independent)

It was easier depending on the class numbers: 'my classes were comprised of small class numbers so it was easy to have group discussions' (Lance).

Teacher engagement set a precedent for student engagement. Students perceived and reciprocated the level of engagement demonstrated by teachers. Students noted that teachers were largely online facilitators with an expectation for students to work independently. Jane (Y10 independent) felt that teachers 'facilitated work to be done but did not interact that much. [They] gave info and then logged off.' Lance agreed with this observation, commenting that his teachers:

set the work for the day and we were then expected to do the work. The teachers were only online for 10–15 minutes for each subject giving instructions for the day. I could chat to them anytime if I was stuck. I thought it was just like a uni lecture.

As such, Shaun did not feel like he engaged with the teachers: 'They didn't really try. I just tuned in when they said something I liked. It was not successful.'

The onus of learning was on the students, and their experience was akin to distance rather than remote learning, which undermined student engagement. Consequently, some students believed that their teachers created barriers to engagement (albeit one would assume that this would have been unintentional).

Student–peer engagement

Peer engagement also varied from student to student. Students used Microsoft Teams group chats, Facetime and Google Hangouts to interact with one another online. Engagement was largely by student choice. The technology was available, but students chose whether to engage with it or not. Lyle felt that he 'got a lot closer with numerous people by constantly calling and checking up on friends'. However, Lance was 'not nearly as in touch with his classmates as he was with the teachers'. Jane's experience involved no interaction at all:

No work done with them. Could interact if you wanted to but no point.

We lacked engagement [with classmates] as the software used did not display pupils faces, and most teachers asked us to mute frequently. (Ted, Y11 independent)

Teachers and parents noted how for younger students, many longed to connect with peers. 'Students pined to meet online and were always willing to contribute to discussions or show examples of their learning' (Gill, Foundation Catholic). However, Eve noted that student engagement online was quite limited. 'The one thing students frequently commented on was how much they missed seeing their friends/teacher.' Engagement had to be monitored. According to Jodi (Y4 Catholic), 'They regularly engaged with each other. This had to be carefully monitored so that pupils did not disrupt "lesson" times in the home.' Dawn concurs with this observation, noting that the students are 'astute electronically and obviously texting whilst listening'. As a teacher, this is challenging. 'Some students chose not to activate their video so you could not see what they were up too. Hard to control this' (Dawn).

For students, online engagement proved to be an opportunity for cooperative learning, 'In my class, I had a group of girls who faceted all day with one another, collaborating and assisting each other with tasks' (Jane). Students found online, small groupwork effective: 'Working together in a google classroom doc which made getting work done more effective and efficient' (Virginia, Y11 state). 'For one of my classes my teacher put us into little groups of 4 to do some class activities over a call which worked quite well' (Kate). Peer engagement was fundamental to student engagement. It created a supportive network that facilitated student learning. Notwithstanding, it was not a replacement for in-person interactions.

Parent–teacher engagement

For the most part, parents were not engaged with teachers unless there was a specific reason to. As Billi (47) states, ‘Some emails were sent for instructions for tasks or when needed clarification but nothing further.’ Many parents were ‘not engaged at all’ with the teachers (George, 49). ‘Not unless she hadn’t completed an assignment’ (Darcy, 55). Michaela (52) concurred: ‘the teachers only engaged to let us know when one of the girls didn’t log in to some of her classes’. Others proactively spoke a few times to each teacher to determine outstanding work items. The responses suggest that parents played a largely supervisory role, stepping in only when required. Saying that, Trish (40) ‘felt comfortable in the knowledge that I could approach (email) teachers if we had a problem that needed to be addressed’.

Mark (52) ‘participated in parent-teacher interviews on MS Teams, which seemed to work well’. A teacher concurs with this view: ‘Online Parent-Teacher interviews were a huge success in discussing how their child was handling online learning’ (Gary, Y4 independent). A few parents were dissatisfied with the teacher’s engagement with the participants and the learning experience. ‘Very limited [parent–teacher engagement] ... was mostly via email’ (Neil, 47). The app used to submit work (SeeSaw) ‘provides the opportunity for individualised feedback and communication, but did not find all the teachers taking advantage of this’ (Neil). ‘It seemed to me that feedback and submission of work was a bit *laissez-faire* ... I felt his teachers were light on digital engagement skills. [He] did not look forward to online sessions with his teachers’ (Will, 65). George was not ‘convinced on the overall quality and ability to manage pace [online learning experience] or specific learning needs’.

Parents played a supervisory role. Yet, the perceived shortcomings of some teachers with the technologically facilitated remote learning *modus operandi* generated dissatisfaction among parents, undermining their confidence in and subsequent desire to engage with teachers.

Individualisation

Participants varied widely in their perceptions of how individualised the online learning experience was. Some teachers found it *more* personal than face to face.

It was more individualised, as we liaised with parents of students who were flagged with difficulties and an individual weekly learning calendar was created for these students. Students on NCCD [Nationally consistent collection of data on school students with disability] also needed to be carefully monitored and adjustments and correspondence carefully documented. (Gill)

Derek concurs that ‘the online platform was more individualised as one on one contact could be made discretely without the reprisal from others in an open environment. I had to prepare for the majority but could communicate to individuals freely.’ However, Derek notes that ‘I had to complete much more preparation than I would normally have had to ... we changed the delivery of content such that the students could work through the material with little teacher input.’ Similarly, Jodi felt that OneNote allowed for individualisation of work, but John (Y10–12 secondary maths) commented that working with secondary students was less individualised, ‘worked more like a university lecture than a classroom. Difficult as students’ cameras were predominantly off.’ Dawn concurs: ‘less [individualised] as the preparation was so time consuming, I did not have enough time to totally differentiate’. Gary found that ‘the content delivery was similar however monitoring the students work and providing feedback was more time consuming and less individualised’. Caryn (Y7–9 state) commented that online learning was less individualised: ‘We have many students with emotional, health or food allergy issues. In a classroom you are able to have private conversations with each student and adjust lessons for each.’ Eve also found online learning to be less individualised: ‘It was much harder to cater for each student in an online capacity ... we couldn’t monitor the students in live time to see who needed modification ... we did become better at this towards the end.’ Hannah (Y1 state) found online learning less

individualised but did attempt differentiation: 'I did email specific parents ... on Curriculum Adjustment Plans for areas like fine motor, English and Maths, the extra work I was wanting them to support their child with.'

In Special Education, your teaching needs to be more individualised but I found this even more pronounced online and depending on how much parental support a student had could advance him even more quickly than in the classroom and at a different pace to his peers. So, in numeracy, I started one student on a higher level and set individualised activities for him which only he and his mother could see. I was also able to offer his mother extra support and give her strategies to use to engage and teach her son. (Justine, Y2 special needs)

From an LSO [Learning Support Officer] perspective,

remote learning was less individualised than traditional face-to-face learning, not by much though. Students may have felt more 'on their own' but were still able to ask questions either at the time or later via email ... Lessons for each subject were live, and whiteboards were used. (Jill)

Jane (Y3/4 Catholic) concurs that online learning

was probably just as individualised ... however it was done differently. I needed to plan completely different programs (particularly for Maths) for my students on ILPs [Individual Learning Plans] to meet their needs. Usually in the classroom they would benefit from enabling prompts to enter into the same task as their peers but this was not always possible ... we scaffolded activities and projects by providing simplified planning templates, or providing links to helpful websites to research. We continued to use levelled texts on Epic so all students could enter into the same task with a text appropriate for their ability.

For the most part, students found online learning to be *less* individualised as they were taught as a 'group'. Teachers addressed students as a group. The instructions were given out for the group' (Lance). It seems that differentiation was not employed online. Lance commented that the teachers

set the work for the day and they were then expected to do the work. The teachers were only online for 10–15 minutes for each subject giving instructions for the day. I could chat to them anytime if I was stuck. I thought it was just like a uni lecture.

As a result, for many students, online learning resulted in a decline in both outcomes and grades. The learning style did not suit them (particularly visual learners). 'My grades dropped quite a bit, it was harder. It was more difficult to understand the teacher. Flipped learning/classroom really came into play' (Virginia); 'Our school told us we were behind the planned term by 55–60%' (Ted); 'Got behind in my work and now not up to date with school work' (Craig, Y12 independent).

I am a visual learner so feeling like I was teaching myself by reading the textbook or just listening to my teacher proved to be very difficult for me. (Kate)

I hated it. It made me stress a lot. I wasn't getting help F2F. They couldn't show me hands on how to do the work which made it harder. I like learning hands on much more. (Shaun)

A student's learning style appears to determine the success of their learning experience online: 'It was a lot harder to stay motivated and was hard to be on my screen for so many hours' (Nel, Y11 Catholic).

From a parent's perspective, Mark felt that some teachers were more engaging than others: 'Some teachers sounded really engaging, others far less so. I wonder whether the teachers had any proper training in online teaching pre-Covid?' Sally (52) observed how less individualised online learning was: 'teachers seemed to need to communicate to the group as a whole and students seemed reluctant to ask questions in such a public forum. Classroom based teaching allows for side conversations.' Gabe noted that 'quieter, and/or less academic students did not volunteer to talk/engage unless called upon'. According to Gabe, 'the teacher's ability to embrace individualised teaching' played a role in how effective the student's learning experience was.

Consideration needs to be given to individual preferred learning modalities and therefore instructions should cater to both visual and auditory learners. Some students [in a school environment], rely on their peers to make sure their understanding is correct ... struggling students do not have this in online learning. (Gabe)

Individualisation was foundational to the engagement of students. Lessons took the form of lectures rather than tailored remote lessons. A lack of individualisation, compounded by screen fatigue, inhibited student learning.

Technology

The Covid-19 pandemic has expedited technology adoption in schools. Students and teachers are competent, confident users of technology. Confidence is extremely high amongst students. 'The technology was what we had already been using at school' (Lance); 'I managed all my assignments online and submitted them as I normally would when at school' (Steve, Y12 independent). Many platforms were used, most commonly Google Classroom and Teams, SeeSaw and Zoom. Caryn remarked that 'Google Teams evolved with our needs.' Subject-specific platforms were employed, such as Stile (Science) and Cambridge (online Maths). Many teachers made their own videos on Educreations and created maths games, quizzes and YouTube videos to engage their students.

With regards to assessment, many teachers encouraged their students to photograph or video their work. Essential Assessment was used for Maths. However, this did encounter difficulties as 'the problem with this was, it was never a true score. We didn't know if the student received help from someone' (Eve). Jane concurs with this, stating that 'we didn't assess formally through remote learning as we couldn't guarantee that the results would be 100% accurate'. Assessment was adapted, for example, by asking the students to submit a handwritten, timed persuasive text for literacy. For younger children, parent involvement in assessment was an issue: 'It was important for me to see and hear each child record their answers and explain the processes, and whether or not mum/dad was coaxing them along' (Hannah). Derek adapted to the online platform by 'assessing some work as graded, just like percentages and I assessed other work on a scale from excellent through to needs attention/unsatisfactory'. Working in Special Education, Justine notes that 'because the level of engagement with our students varied so greatly and it was so individualised our assessment was observation'. For many teachers, assessment adapted to suit the content and the online/home learning environment. Jane discusses the example of the Rich Assessment Task for an inquiry unit which was adapted to suit the online learning platform. The task initially intended for the students to create a diorama to be showcased at an expo. This was changed to become a 'virtual museum' where students videoed their moving part in the diorama with a voice recording.

For parents, experience and skill in technology varied from 'reasonably comfortable to extremely confident'. They were encouraged to engage with teachers through emails, in-app comments and chats. The older students were left to work independently, and parents were there as a support. For younger children, online learning proved more time-consuming, and parents had to upload completed tasks and videos. Technology dichotomously facilitated educational interactions and conversely represented a fundamental barrier to engagement. The findings reveal that peer, parent and teacher engagement, individualisation and digital competence support or conversely undermine student engagement.

Discussion

Australia has a rich history in distance education – particularly for children in regional areas. Some of the challenges faced during Covid-19 are similar, but most are unique. When Australian schools went into Covid 'lockdown' in March 2020, teachers, students and parents in metropolitan areas had no choice but to adopt online platforms and engage with learning via technology. The transition was unprecedented.

From the findings, four contributions emerge. We examine the implications of each in relation to the relevant literature. First, we identify the reciprocal and dichotomous nature of engagement. The extant literature (Bates, 1997; Bernard et al., 2009; Sahin & Shelley, 2008; Turvey, 2006) defines engagement by its four relational components; peer, student, parent and teacher. The findings confirm the significance of and interrelationship between student, teacher, peer and parent engagement. Yet, we go beyond the extant literature to identify the reciprocity and dichotomy of engagement in a remote learning context. Central to both Moore's (1973) theory and Borup et al.'s (2014) framework is the notion that peer, teacher and parent engagement will in turn maximise student engagement. Research shows that when meaningfully integrated, interaction (student–content, student–student and student–learner) increases learning outcomes (Bernard et al., 2009). Indeed, lack of engagement was a major contextual (Holmberg et al., 2005) challenge in this study. Despite teachers' self-reported efforts in this regard, low student, peer *and* parent engagement prevailed. One explanation for this is that teachers' efforts to engage failed. Students measured teacher engagement through a prism of understanding, which in turn determined their own engagement or lack thereof, suggesting that the ability of teachers to communicate their engagement, in a way that is understood by students, is an important consideration and precedent for achieving student engagement. Yet student presence, albeit a prerequisite for engagement, was not equivalent to authentic engagement.

Second, we demonstrate the heterogeneity of individuality. Moore's (1973) 'least distant–most distant' continuum suggests that group communication was successfully achieved during the Covid-19 school closures, but individual communication was not. This was not due to technology limitations, but to matters of scale and scope – in particular, finite teacher capacity. Indeed, teachers can be excused for feeling like 'instructional MacGyvers' during the pandemic, having to improvise solutions in less than ideal circumstances. Expecting them to communicate one-on-one with students, while highly desirable, was never going to be realistic under the circumstances. Perhaps this also comes down to emergency online (as reported here) versus deliberate and well-designed online, which was less prevalent. Perhaps the latter is required for individualisation to come of age? Notwithstanding, individuality was heterogeneous. Thus, to achieve *true* engagement the pedagogical framework for remote learning needs to consider and accommodate such diversity.

Third, we expose the dark side of technology. Advancements in technology have facilitated and enabled remote learning. Technological expertise was not a barrier for students who were unanimous in their confidence and self-reported competence. That said, technology proved to be a double-edged sword: enabling, constraining yet not engaging. While platforms like Zoom, MS Teams and Google Meets may have come of age in Australian schools during Covid-19, the learner–context interface (Holmberg et al., 2005) proved sub-optimal. According to Garrison and Akyol (2013), an optimal educational experience requires engagement with participants, social presence, teaching presence, cognitive presence and supporting discourse – all of which were not universally achieved during the Covid school closures. Only engagement with content was, to some extent, achieved. This is understandable, given that in the case of emergency remote teaching, the primary objective was not to re-create a robust educational ecosystem, but rather to provide temporary access to instruction in a manner that is quick to set up and reliably available during an emergency or crisis (Hodges & Fowler, 2020).

Finally, we integrate three disparate theories of remote education to advance an integrated understanding of engagement in the context of remote education during a crisis. We affirm the significance of the concepts of engagement (Borup et al., 2014), individualisation (Moore, 1973) and technological competence to remote education (Sahin & Shelley, 2008).

Conclusions, limitations and future research

Connecting with and engaging students was a top priority for teachers – often taking priority over curriculum. School leaders attempted to set the right tone, and teachers focused on structure to underpin engagement. For the most part, these well-intentioned efforts fell short with the majority of students feeling less engaged with both their teachers and peers. Indeed, the study reveals that social isolation was a major challenge for students. Parents, for their part, remained pragmatic (‘means to an end’) but largely unengaged with teachers. For the most part, students found remote online learning to be less personalised and quite challenging. While the pandemic has heralded the coming of age of technology in primary/secondary schools on some levels, how best to employ it remains unclear. Indeed, the two biggest take-outs across the three stakeholder groups are heterogeneity (no two participants’ experiences or perceptions are the same – and the individual variances are large) and compromise (almost all parents and students, and most teachers, would prefer to be in the classroom). However, on the upside, as a large-scale field experiment, technology was a qualified winner – and once the pedagogy and learning design catch up (in time for the next pandemic perhaps), many of the lessons learned from Covid-19 will prove to be instructive and enduring.

Like all similar studies, this one was not without limitations. We focused on Australia’s most populous states, NSW and Victoria, which were also the most adversely affected by Covid-19. These served to provide rich insight into remote learning, yet future research could test the framework, extending the study to other countries which have transitioned from traditional to remote learning in response to the pandemic.

Future research could also focus exclusively on Victoria, with its ongoing draconian stage 4 lockdown and persistent (and significant) ‘second wave’. Or a comparative case study, contrasting Victoria with South or West Australia. Opportunities also exist to track the longer-term post-pandemic impact of technology and remote learning on schools. Will flipped classroom approaches so popular at Australian tertiary institutions find their way into secondary schools on a sustained basis? The technology has proven itself now, but what is still a work-in-progress is the underling pedagogy. The challenge is not the online/remote delivery, but the learning design that underpins it.

Another opportunity for future research is to consider not just the online instruction, but the co-curricular engagement and other social supports. Face-to-face education is not simply contingent on good teaching alone. Teaching is one instructional aspect of an overall ecosystem designed to support learners with formal, informal and social resources (Hodges & Fowler, 2020), most of which were conspicuously absent during the emergency remote teaching described in this study.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes on contributor

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Appendix A. Interview protocol

Questions for Parents

1. How engaged were you with your child's teachers online?
2. How engaged was your child with their teachers online?
3. How engaged was your child with their classmates online?
4. Did you engage with other parents online?
5. Did you find the online platforms to be more individualised than traditional face-to-face, or less? Please explain
6. How confident are you with computers/technology?
7. How competent are you with computers/technology?
8. Did your computer/technology skills improve during term 2?
9. Anything else you'd like to add about you/your child's remote learning experience in term 2?

Questions for Students

1. How engaged were you with your teachers (online)? Please explain.
2. How did the teachers try and engage with you online? How successful was this?
3. How engaged were you with your classmates online?
4. Was the online platform more or less individualised than traditional face-to-face? Please explain.
5. How did remote/online learning during COVID-19 affect your learning outcomes?
6. Do you think you would have fared better or worse *without* COVID-19/remote learning in term 2?
7. How confident are you with computers/technology?
8. How competent are you with computers/technology?
9. Did your computer/technology skills improve during term 2?
10. Anything else to add about your remote learning experience in term 2?

Questions for Teachers

1. How did you 'set the tone' (i.e. establish routines, expectations) for remote online learning in term 2?
2. Were you able to engage with the children (online)? If yes, how? If not, why not?
3. How engaged were your students with one another online?
4. Was the remote platform more or less individualised than traditional face-to-face? Please explain.
5. How was your content modified to suit online delivery?
6. How were learning outcomes accomplished through online teaching/learning?

7. What strategies were most effective with online teaching? Please specify
8. How did you assess student learning online?
9. With hindsight, could you have been better prepared for Term 2 online, or are there things you would do differently if 'forced' online again (e.g., a 'second wave' in a subsequent term)?
10. Anything else to add about your remote teaching experience in term 2?