Exploring the Opportunities for Online Learning Platforms to Support the Emergency Home School Context

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ABSTRACT
The COVID-19 pandemic and subsequent closure of schools forced families across the globe to transition to school at home. This unprecedented context is likely to have a lasting impact on the practice of schooling and the role of online, digital platforms within school contexts. In this paper we present a contextual inquiry of an ‘emergency home school context’, detailing how nine young families in Melbourne, Australia adapted to the unexpected introduction of school to the home following the government-directed closure of schools. Through an online interview and photo-journal study, we develop an emplaced understanding of the context detailing how the relations between people and places around the home evolved over time. We present five design considerations for digital platforms to support the emergency home school context, placing focus on the fluid roles, relationships and evolving sense of place.

CCS CONCEPTS
• Human-centered computing → Empirical studies in HCI; • Applied computing → Distance learning

KEYWORDS
COVID-19, emergency home school, remote learning, online platforms, situated learning, sense of place, families

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1 INTRODUCTION
The recent closure of schools around the globe in response to the COVID-19 pandemic caused a major disruption to primary and secondary education as teachers and students were suddenly forced to carry out their usual teaching activities remotely from their homes. The ‘emergency home school context’ that emerged following school closures is unprecedented, with researchers, educators and families still grappling to fully understand its impact. Many schools responded to their sudden closure by transitioning to a fully flexible, online mode of teaching, where teacher-student interactions were mediated by online learning platforms [32]. This often involved the re-appropriation and expansion of the schools’ established digital infrastructure, and required teachers to adapt their teaching plans for an online context [16, 17]. Furthermore, the unexpected introduction of school to the home required families with school-age children to adapt their domestic and professional lives to support their child’s continued education [6]. Whilst the field of remote learning has historically been a research focus in the field of human-computer interaction and beyond [20, 42, 43], the emergency home school context introduces significant differences in terms of roles, expectations and assumptions of schooling that are less understood and are likely to have lasting impacts on the design and use of digital platforms.

Digital resources and online learning platforms are an important component of the learning ecology of schools across the Global North, providing an engaging format to introduce subject matter, mediate different modes of learning, administer homework tasks [9, 27] and manage school data [37]. It was therefore natural for schools to leverage these established platforms to scaffold interaction with students during the transition to remote home school. Whilst online learning platforms have enabled teachers and students to continue an emergency form of schooling outside the classroom, they are not necessarily fit for purpose: often resulting in a ‘patchwork’ of platforms to provide an online schooling experience that was ‘good enough’ to deal with what was hoped to be a short-term crisis before a return to normality [19]. As such, there is an urgent need to understand this new emergency home school context to inform the design of online learning platforms that can better support teachers and families now, and in future.

In this study, we describe an online, qualitative study carried out with nine families from Melbourne, Australia. Each family had primary school-aged children (5–10 years) and undertook emergency home schooling from April to June 2020. Building upon Dourish’s [12] and Pink’s [34] conception of context as emergent, relational and emplaced, this research takes a holistic look at the emergency home school, including the relations between the people and places in the home school that emerged and evolved over time. We then use the revelations about the experiences of families to generate five recommendations for the design and use of online learning platforms that are better aligned with the situational constraints and opportunities of the emergency home school context. Whilst the current scale of school closures is unprecedented, further school closures are predicted as the result of a rise in environmental crises and the future management of COVID-19 (or further pandemics).
Thus, we contribute insights for the HCI community to develop online platforms that better support schools and households in their pivot to emergency home schooling.

2 THE EMERGENCY HOME SCHOOL CONTEXT

The emergency home school context of focus in this study emerged in late March 2020, following the Victorian Government’s closure of primary and secondary schools to curb the transmission of COVID-19. With two weeks prior warning, schools across the State were instructed to transition to remote learning—the first of two school closures in Victoria during 2020—which lasted for six weeks until early June that year. The emergency home school context is situated in the home of families with school-age children, away from the classroom, teacher and peers. It can be characterised and distinguished from other remote or home-schooling contexts because:

i) it emerges following the full or part-closure of schools in response to an external crisis or disaster;

ii) it produces a sense of urgency and unpreparedness where parents and students students are rapidly adapting to the sudden imposition of the school in the home;

iii) it represents a temporary situation with an assumption that school will return to normal at some point in the future;

iv) the arrangement is fluid as restrictions evolve during the crisis, often resulting in staged transitions to and from school;

v) members of the household are also responding to the state of emergency, performing their jobs from home;

vi) parents, students and teachers did not voluntarily elect to move to a home-school environment.

The unprecedented nature of this scenario occurring at scale has naturally meant little research into emergency school contexts exists on which to draw insight.

3 BACKGROUND AND RELATED WORK

3.1 The transition to online learning

This rapid pivot to online learning has been advantageous for some schools, having accelerated long-term plans for online and digital expansion and increased the digital competences of the students and teachers forced to engage in online forms of education [23]. It has also led to the development of new platforms that look beyond curriculum-based learning objectives, to consider how valuable social and place-based encounters that were lost following school closures can be recreated in online, virtual environments through the design of games for social bonding [22], or using online video conferencing to support peer ‘co-presence’ in the absence of a classroom [25]. Furthermore, we have also observed the emergence of innovative social networking practices, such as the crowd-sourcing of teacher expertise for students who can no longer access their usual teacher from home [33].

Despite these benefits, questions have also been raised as to whether the design and use of online learning platforms and the types of interactions they support are relevant to the unique qualities of the emergency home school context. Many online learning platforms have been designed to replicate the instructor-led, centralised approach to schooling commonly seen in the classroom at home—an entirely unique schooling context [10]. Some have responded by exploring how online platforms may be designed to reflect new forms of learning that have emerged in response to the emergency home school, such as distributed, student-led approaches [10], and the design of hybrid classrooms which speculate on a future classroom where some students are working from home, and some in the classroom [44].

The emergency home school context is only a recent phenomenon emerging in response to the COVID-19 pandemic, and our understanding of this context and the experience of families is still coming to light. Designing online learning platforms that are tailored to the emergency home school requires an in-depth inquiry into this context [2], including the new practices and interactions between people and places in and around the home following the unexpected introduction of school. Research of this nature is valuable given the predicted increase in school closures in future [13], and the potential roles of online learning platforms in conventional schooling after schools re-open [38, 44].

3.2 Family experience of the emergency home school

Recent research from the fields of education and sociology on the emergency home school has raised a number of issues regarding the experience of families across the socio-economic spectrum. Firstly, access to education has been challenging for many, as online schooling requires families to have established digital and online literacy and infrastructure, such as access to reliable internet and digital resources [6, 13, 45]. Students without access to these resources have been unable to participate in school for extended periods, furthering their disadvantage when schools do finally re-open [38].

Another concern is that emergency home school relied on parents and families to be able to negotiate the sudden imposition of schooling in the home. A number of surveys have explored the experiences of families, revealing that parents have been forced to re-negotiate work hours and engage in their child’s schooling [8, 13, 36, 38], exposing students to unequal levels of attention and support otherwise partially mitigated through the presence of schools [7, 38].

Furthermore, the home school has relied on schools having established digital infrastructure and online learning platforms, and staff who are able to use these platforms to support learning [8, 38]. Recent research has revealed that the rapid pivot from classroom to online teaching has impacted teachers unequally, negatively affecting those with lower digital competences, which has had an obvious flow-on effect to their students [3, 23]. This research highlights the many contextual complexities that have arisen in response to the closure of schools, and the value in studying the role of digital artefacts and the design and use of online learning platforms to better support access to quality schooling.

3.3 Learning Contexts & Online Learning Platforms

The relationship between context and learning is well established within the field of education. Influential theories such as situated learning [24] and ecological systems theory [5] assume learning is situated and shaped by an ecology of factors (e.g. people, places,
objects, socio-cultural norms) that frame our interactions and understanding of the world around us. Similar perspectives are central to HCI research, as illustrated in Suchman’s discussions of situated action [41] and Dourish’s [12] conceptualisation of context as a relational phenomenon that emerges through the quality of the activities and interactions between people and place over time. These perspectives have been reflected in systems and platforms that interact with the physical properties of space [39], the social contexts of places and the communities which inhabit them [35], and participatory design approaches that seek to align designs with the tacit practices of users (e.g. Spinuzzi [40]).

Interestingly, this situated conception of context has not permeated the design of many online systems and platforms intended to support schooling [46]. Primary and secondary schools are increasingly reliant on online learning platforms, such as learning management systems (LMS) to support content delivery and the administration of student-related data [37], and online educational tools, quizzes and games to engage students in learning concepts or exercises [15]. However, rather than focusing on the classroom learning context and its specific benefits, the majority of online learning platforms are designed to reflect the ‘martini’ model of online learning— “any time, any place, anywhere” [31].

This has led to context-agnostic platforms that are not designed to consider the situation in which learning is taking place, instead providing a ‘standardised’ tool that can be accessed by students at home or in the classroom [31, 37]. Although agnostic, we would posit that these platforms actually rely on a variety of tacit assumptions about their contexts of use, such as the teacher being based in a classroom at a school, while the student is able to engage either during official school hours within the institution or at home during recreational time.

While many available online learning platforms are usable within the emergency home schooling context, they are often not designed as the sole infrastructure through which learning takes place. Instead, they are generally intended as one tool within a rich school learning ecology, where students interact directly with teachers, peers and learning resources and curriculum-based learning activities [28, 47]. Without the usual infrastructure of the school to support a students learning, there is reason to look critically at how online platforms support student engagement and learning within the emergency home school context.

4 STUDY METHOD

The primary aim of this study was to better understand the “emergency home school context” from the perspective of parents and primary school-aged children, and draw on this new knowledge to inform the design and use of online learning platforms specifically for this context. Research was carried out within the metropolitan area of Melbourne, Australia towards the end of the first six-week phase of State government mandated school closures. This was part of a suite of restrictions put in place to reduce the transmission of COVID-19, alongside social distancing with people from outside your household, working from home, and the closure of non-essential businesses.

Nine middle-class families with primary school-aged children affected by school closures were recruited via informal networks and snowballing. A parent representative from each family (six mothers and three fathers), and one or two of their primary school children aged 5-10 years (n=11) participated in research. These families were from different suburbs from across Melbourne. Six lived in houses with backyards, whilst three lived in apartments. Eight were two-parent families, and one was a single-parent household. All children attended their local public school.

A qualitative research approach [30] was used to gather rich data on family experiences of the emergency home school. Prior to commencing research, institutional ethics approval was obtained, and the research was explained to the parents and children via video conferencing software before seeking their formal consent. The following three online research methods were carried out during the last two weeks of a six-week period of school closures, allowing parents and children to provide retrospective insights of their home schooling experience and how it evolved over time:

1. An introductory online interview with parents and children, facilitated by the lead researcher using Zoom video conferencing software (zoom.us). Child interviews (15 mins) were carried out first with the parent present, and parent interviews (30–45 mins) were carried out directly afterwards. These interviews aimed to understand a day in the life of the home school; the challenges and opportunities that emerged for both parents and children; new practices families adopted to adapt to home schooling; and the role of digital, online platforms and applications in the schooling process.

2. A 10-day photo-journaling activity where children (with the support of parents) were invited to take a single photograph each day of a home schooling activity that was meaningful to them. This image was to include details of the place where the activity was carried out, and include a textual, video or audio description of what they were doing. Parents sent these images and descriptions to the researchers via a platform of their choosing, which included email, messenger apps (WhatsApp, Facebook), and online drives (Google Drive, Dropbox).

3. A final online interview over Zoom was carried out with children and parents to reflect on the photo-journaling activity, and gather further insights into the daily practices of the home school, the places they encountered, and the new types of roles and relations between parents, children and teachers that emerged. The child interview (20–30 mins) was carried out with children and parents together using photo-journaling material as a prompt for discussion. A final 30 min interview was then carried out with parents to hear more about their personal experiences of the home school over the 10-day period and prior.

Interviews were audio recorded, transcribed and coded. Drawing on Dourish [12] and Pink’s [34] emphasis on the emergent and relational qualities of context, transcripts were coded according to the relations between people (parents and their children), and place (location, values, norms), and how these relations emerged and evolved over time. These themes were then further refined to highlight the commonalities and differences expressed by participants, and provide a rich description of the data.
5 FINDINGS

The sudden closure of schools and unexpected introduction of the school to the home caused a major disruption to the practice of schooling and domestic life for each family. Here, we provide a holistic description of how this was experienced by parents and children, and how they adapted to balance the priorities of the emergency home school with other domestic and professional responsibilities. We divide the findings into four main themes that emerged from the analysis: (i) how schools adapted to the shift from real-time, face-to-face to remote, online schooling; (ii) the impact of the introduction of the school at home on the role and responsibilities of parents, many of whom were also working from home following closures of their workplace; (iii) the new sense of place that emerged in the emergency home school, and how this influenced student learning; and (iv) the strategies and innovations that parents developed over time to adapt to the challenges and opportunities presented by the emergency home school.

5.1 Transitioning from face-to-face to remote and online

5.1.1 A patchwork of on online learning platforms and applications.

In the absence of a physical classroom, real-time, face-to-face interactions between students and their teacher and classroom resources were no longer available. Schools responded by drawing on a range of established online infrastructure, tools and applications, and adapting them so teachers and families could engage in an online version of schooling. For example, participant schools each nominated a Learning Management System (LMS) where families and teachers would access the learning tasks set by teachers, upload completed assessments, ask questions or receive feedback from the teacher. Teachers also directed students to curriculum-aligned online learning platforms, such as Mathletics1, Manga High2, Study Ladder3 and Decodable Readers4, as a substitute for numeracy, literacy and language lessons. YouTube videos with pre-generated content were also used extensively to introduce students to a diversity of concepts, including science, sustainability, and health and physical education. However, the degree to which teachers relied on these online platforms varied with different year levels. Students aged 8-years and above spent more time online, as teachers relied on educational platforms with pre-designed, engaging learning activities. For example, many students used the popular platform Mathletics5, where students can select an avatar and engage in gamified numeracy challenges and quizzes that make the process of learning mathematics enjoyable and collaborative. In contrast, younger students under the age of 8-years were set more tactile learning tasks that relied on student engagement with resources in and around the home. These had relatively little interaction with online platforms, other than accessing the learning material and uploading an image as ‘evidence’ of the completed task for the teacher. For example, one numeracy lesson invited students to measure the lengths and volumes of different objects around the home, whilst art classes often involved students collecting materials from outdoors (e.g. leaves, flowers, rocks, seeds) and creating a design or collage with these materials [Figure 1].

5.1.2 Evolving student-teacher interactions. Whilst online learning enabled teachers and students to continue engaging in schoolwork, the nature of student-teacher interactions was mostly asynchronous and transactional, preventing teachers and students from engaging in much of the rich relational work (e.g. engaging students, differentiating tasks to different student abilities) that is supported in a situated, classroom setting. As stated by one mother, some teachers tried to address the disconnected forms of communication by creating personal videos for their students, or providing voice rather than textual feedback:

“They can’t see if they’re struggling or racing ahead...all the material they’re providing is ‘middle of the road’, so my kid who is quite bright just zooms through these tasks...And the kids don’t get that personal contact with the teacher, which Evie misses. Her teacher has started to do feedback using voice messages, rather than text messages and Evie loves that... hearing his voice seems to make a difference to her motivation.” - Mother with a 7-year old child

Another example saw a Year 2 teacher take a video for students on his morning run around the neighbourhood, which provided a connection between the students and the places they would usually encounter on a school day. Another Prep teacher would send a video message to her class each morning from her lounge room, which always included her dog who she would dress up in a variety of different outfits (e.g. unicorn, lion). These videos were an important motivator for the students, as illustrated by a 5-year old girl who expressed that she hoped the dog would be in the classroom when she went back to ‘normal’ school.

There were some instances where teachers utilised video conferencing software to engage with the whole class or groups of students synchronously and face-to-face. However, this only occurred at the schools of five of the nine families, and teachers tended to use video conferencing as an opportunity to ‘check-in’ with students and monitor their well-being, rather than engage in any formal teaching. Children appreciated these video encounters with their teachers and classmates, as it was a way to reconnect and feel a little more like they were ‘at school’. As expressed by one 8-year old boy:

“I get to see my teacher and my friends on there so I like that... [My teacher] shows us the classroom on the video so we see new things on the walls...I sometimes get to see my desk”

These video encounters also give parents an opportunity to see their child ‘at school’—a context that had previously been a ‘black box’ for many parents with children at a conventional school:

“It’s been interesting to see the interactions between David and the teacher...just seeing what teaching looks like...what goes on when they’re explaining something...I would never have seen any of this before...” - Father with a 5-year old and 8-year old child
However, the online format also gave parents an unusual insight into the vulnerabilities and challenges the teachers were experiencing following the disruption to schooling:

“One of Jenny’s teachers wasn’t doing well at all - he was all over the shop, and you could just see it on his face every morning. He was saying things like, ‘I had a terrible day yesterday because I couldn’t get my iPad to work and felt a bit stressed and my wife is not happy with me working on a Sunday.’” - Mother with a 5-year child

Finally, the reliance on online platforms and video conferencing software to support student-teacher interactions was not without its challenges, as it required both teachers and students to have access to a table, computer with a webcam, and a higher bandwidth internet connection, which was not always the case.

5.2 An increase in the roles and responsibilities of parents

The online and largely asynchronous teacher-student interactions supported by the online learning platforms prevented teachers from carrying out the ‘relational work’ that supports student learning and engagement. Relational work can include the careful explanation of learning tasks, tailoring activities according to observed student interest and capacity, and tailoring communications to student preferences [14]. During this study, parents took on much of this vital relational work to ‘fill the gaps’ as the online transactional approach was not appropriate for engaging primary-age students in school without in-person support. The types of additional work carried out by parents in the emergency home school included:

- The provision of school resources, such as a desk, tablet, internet access.
- Supporting students to navigate online learning platforms and downloading and uploading necessary school tasks.
- Interpreting of tasks set by the teacher, as whilst students were able to read activities set, many were unable to interpret them and carry out the activity.
- Motivation and continued engagement, particularly for younger students (<8 years) who required a parent to support them through an entire learning task.
- School administration, which involves managing the students’ school schedule; picking, choosing and tailoring school tasks; ensuring students connected to online learning platforms each day for ‘roll call’; uploading assignments for assessment; and completing evaluation surveys.

In addition, parents were carrying out this school-related work whilst managing a household and meeting professional commitments, all of which were generally carried out at home.

5.2.1 Parents’ experience of emergency home schooling. Whilst they assumed that the emergency home school was temporary, all parents felt stressed and overwhelmed with the additional work that came with the sudden imposition of the school into their home. Parents were expected to shift between multiple roles throughout the day. For many parents, these roles were previously spatially and temporally delineated, but the closure of the school and workplaces meant that they were playing out at the same time in the home:

“I'll be doing home school with the older one, then will have a work email to respond to, then something will happen with the other kid. [My husband] is here to help most days, but the in-between stuff falls to me... My work hasn’t been that flexible which has added to the stress.” - Mother with a 3-year old and a 6-year old child

The imposition of the emergency home school also changed the quality of the parent-child relationship, creating new tensions as children were not expecting to be ‘taught’ by their parents:

“It changes your relationship a bit. You have to teach them like a teacher would, and they’re not used to receiving that kind of instruction from you...there can be a lot of opposition to being given instructions because you’re mum, not the teacher.” - Mother with a 9-year old boy
Despite this challenge, many parents recognised the benefit of engaging more directly with their child’s schooling during the emergency period:

“It’s actually been really good for me to have a lot more insight into Jimmy as a student, and where he’s at with his school, and what he enjoys and what he really doesn’t enjoy... When you ask kids about what they’re up to at school, you get very limited response, so that part’s been really nice for me to see where his strengths are and where he could do with some more help in future.” - Father with an 8-year old boy

Parents also felt ill-equipped to carry out their role in supporting their child’s home schooling. For example, one parent noted feeling unable to adequately gauge their child’s learning level and progress:

“One of the major challenges at the beginning was not having much of a gauge... what was revision and what was new... and where she needed support, and how to give it to her.” - Mother with a 6-year old child

Others were unclear on what teachers were expecting of their students from the learning tasks set, when to support their students, or how to effectively scaffold the process:

“When do I applaud? When do I push? When [the teachers] tell us what’s expected, what is actually expected, and what’s just setting an end goal for the children instead of a core expectation?” - Mother with a 5-year old child

Furthermore, most parents were unclear on what their role was in the emergency home school, as the learning activities from teachers were written for students. Whilst there was an implicit assumption that parents were to assist, it was unclear on how they could support them. Additionally, parents were mostly unable to seek advice from teachers when they needed it:

“The only way I can access the teacher is by logging into the LMS as my child. There’s no way for me to contact the teacher directly to ask a question... I know some other parents that can contact their teacher... it’s hard to know what to do because teachers are so busy.” - Mother of a 5-year old girl

5.3 The emergence of a new sense of place

With the introduction of the school into the home was the emergence of a new sense of place where practices and associations of the home and school that had previously been spatially and temporally separated, were merged. With the closure of schools, students no longer had access to the school institution where they usually interact with peers, friends and educators; access school and classroom resources (e.g. playground, desk, learning materials, tablets/computers, internet); and engage with the culture of school, including the rules, meanings and structures designed to frame and motivate student schooling [7]. Instead, school was carried out at home – a place that was not previously associated with school, and with an entirely different set of associations, rules and assumptions around the role and practices of children, and their adult caregivers.

5.3.1 Creating a separate ‘home’ and ‘school’. Some families, with the encouragement of schools, tried to address this by establishing some form of separation between school and home. For example, many set up a workstation for students to ‘do schoolwork’ that was separate from other areas, or established a regular school schedule, which often required the child to dress in school uniform when ‘at school’ and casual clothes when ‘at home’ to signal a shift in context. Whilst this approach worked for some families, others found that school life and home life very much bled into each other as children would do their schoolwork in different parts of the house depending on their mood, where parents were located, where they felt comfortable, or where the internet was most reliable, as expressed by one father who said:

“In theory, they’re meant to learn in their learning space but we don’t do that because they can’t be bothered sometimes to go in their rooms so I’ll teach them around the kitchen table or in the living room... The school made us set up these learning spaces with particular posters and particular equipment and they’re also meant to set up a reading fort or reading cubby where they go and read, but again, they’ve got a space where they read anyway so we’ll just go and use the one we do...” - Father with a 5-year old and an 8-year old child

This fusion of school and home was further confounded by parents introducing their work practices into these spaces if they were required to work-from-home, so what was previously the dining table became the work desk or the school desk, as well as a place for eating and recreation. In addition to this blending of spatial structures was a blending of temporal structures where the schedule of the school day was continuously shifting in response to the child’s mood, their engagement in specific tasks and parent commitments. Many parents were juggling a diversity of work, school and domestic responsibilities so their focus and priorities would regularly shift to balance priorities each day, as illustrated in this quote by one mother when asked about a ‘typical’ school day.

“I’d say (school is) about a three-hour day, but every day can be really different because their mood and attitude to learning can be really different. So sometimes you can power through it in three hours, and then other days it might be twenty-minute blocks throughout the day. And then we also have to be flexible depending on what John and my day looks like. Sometimes I have meetings or deadlines that I can’t shift. And then school gets postponed until after that.” - Mother with a 5-year old and 7-year old child

5.3.2 The influence of a new sense of place on school and home. This new sense of place presented a range of novel challenges to parents trying to engage their child with school. Firstly, many children were unmotivated to do schoolwork in the home environment away from their classroom, desk, teacher and peers, and parents found it challenging to motivate them because they were not ‘at school’. This was illustrated by one mother who said, “There can be a lot of opposition to being given instructions or doing something that they want to do because they’re in their home environment. And normally for them this is a place where they play.”
Secondly, it disrupted some of the rules and rituals parents and children had established at home. For example, many parents had rules around the time allowed for screen use which were discarded during the emergency home school because digital online interactions were so vital to schooling. Others remarked that emergency home schooling had changed the way they use and organize their home. For example, one mother commented that her ‘office’ that had been previously out-of-bounds to her two children had been re-appropriated as a school space and was unlikely to return to a private office space because of the shift in place associations, “This used to be my sacred space but both kids come in here all the time now… When school goes back it’ll be hard to shift back to it being a ‘no kid zone’ again”.

Finally, many parents expressed concern that their children were developing poor work habits as they didn’t have access to the usual school structures that promoted a balance of work and recreation. This was exacerbated by the use of online platforms where students were able engage in schoolwork at any time. This issue was illustrated by one father describing the work practices of his 10-year old son:

“As the weeks went by… we tried to set limits around ‘school time’ and ‘not school time’ … The general lack of framing in terms of time and space, you know, … it makes them think that they can’t switch off. He’s beginning to gain that kind of mindset almost like us, you know? … We’re always kind of working. And you can see how the platform in a way encourages that because the platform is always on. And sometimes around 6 and 7pm you can see him turning on the computer and checking the stream to see if somebody has posted something.”

This issue of poor work practices was exacerbated by the absence of peer-to-peer contact in the emergency home school as students no longer had access to peer support, and no way of gauging their progress in relation to others in the class. This was a concern for older children (>8 years) who demonstrated a greater attachment to, and reliance on their peers for learning, as expressed by one 10-year old boy who said “I don’t know if I am ahead or behind in class… that makes me stressed”. Interestingly, most schools did not provide scaffolding of peer-to-peer interactions, and those that did tended to limit its use because teachers and parents found the chat between students had little relevance to learning material, and was challenging to regulate.

Despite these challenges, the new sense of place that emerged offered a number of unique benefits for children and parents. For example, all child participants listed a range of benefits of doing school at home, including spending more time with their parents, having cooked lunches in the middle of a school day, reading in bed, and playing with their siblings. Being away from school also meant children no longer had to negotiate some of the more challenging experiences of schooling, such as bullying by peers, the social pressure of the classroom, and carrying a heavy backpack to and from school each day, as illustrated by one 5-year old boy who said, “I feel safe here… The kids I don’t like aren’t here”.

Similarly, many parents appreciated the additional time with their children, and the unique opportunity to support them more directly in their schooling. Parents also enjoyed the new relationship they had cultivated with teachers and the school through the period of the emergency home school, with many wanting to continue their involvement in their child’s schooling after schools re-opened. As one father reflected:

“ Weirdly enough, I had no idea who [my daughters’] two teachers were because you’d really only meet them at parents’ evening after a term or two, so I now know the teachers very well. I actually know all the teachers in the school because all the teachers are pitching in with bits of work so you’ve really gotten to know the teachers and know what they do. … You get a sense and feel the relationship with your kids is a hundred times better. [Previously, they would] come home from school and you’d ask - “How was it?” And they’d say “Good.” But now, because you’ve been doing it with them, you’ve got much more of a rapport with them when it comes to talking about school work or reading or anything and they’re getting a lot more attention so they’re super keen.”

5.4 Parent innovation to adapt to school at home

The introduction of the school into the home was treated as an unexpected and temporary imposition on families. Parents maintained a high degree of pragmatism in their approach to the home school, often improvising or experimenting to meet the demands of work, school and the home in a way that was ‘good enough’. Through these constraints emerged a number of innovative approaches to home schooling that parents generated to work-around challenges and opportunities as they emerged. These are summarized as:

Tailored approaches to teaching: Parents adopted a range of teaching approaches to negotiate the demands of schooling with the complexities and priorities of work and home. Many of the parents adopted a flexible approach to schooling where they selected the subjects that they considered both important and feasible from those set by the teacher. Core subjects such as numeracy and literacy were generally prioritized over physical education, art or sustainability, and these activities were generally fit around other domestic or work commitments, as explained by one parent:

“You can cut corners with it because if it’s, ‘Go for a walk in the park for 45 minutes’, we’re going for walks in parks all the time. So we just skip over that and get to the more important stuff – the maths and the English”. - Father with a 5-year old and 8-year old child

In contrast, other parents rigorously followed the schedule provided by teachers to maintain the structure of the school day and ensure their child didn’t ‘miss out’ on important learning:

“We muddle through the day. To be honest the structure helps both of us.” - Mother with a 5-year old child

The emergence of new place relations: This new-found role in their child’s schooling, coupled with a new sense of place, inspired many
parents to engage in more informal place-based learning activities with their child, where they would weave more formal curriculum-based knowledge into everyday activities. For example, one parent would take his child on bird spotting expeditions in the local park on sunny days when it was difficult to concentrate; another mother would incorporate mathematics into cooking activities; whilst other parents supported their children to forge new relationships with the natural places they visited each day, as described by one father whose children had built a tree house in the local park during the period of emergency home schooling. The benefit of this approach to learning was that parents were able to tailor it to their skillset, the child’s interests, and resources available in and around the home, as one parent commented ‘Having school at home has opened my eyes to all the different learning activities everywhere. I can now improvise with most things—incorporate a counting game or get them to think about the chemical make-up of something’.

The emergence of new digitally mediated social interactions and networks: Through the emergency home schooling both parents and children relied on social networking platforms to connect with parents and peers that they could no longer see due to social distancing restrictions. For example, four parents were members of different WhatsApp groups for parents in their child’s class setup explicitly to share experiences of home schooling. Two parents joined Facebook groups for parents within their local area to share resources and knowledge, whilst others would organize to go to the local park or public space to see familiar faces from the community (at a suitable distance). Whilst contact was limited due to social distancing laws, these brief encounters with other families were an important motivator for parents, as described by one mother who said, ‘Connecting with other parents who are in the same boat has been important for me… I mean it’s chaos, but we muddle through together in a way’. The absence of peer-to-peer contact in the emergency home schooling led some parents to organise ‘online play dates’ with other children in their class, or children of their friends. For example, one mother organised a weekly reading date for her 9-year old boy and the son of a friend. The boys would meet over WhatsApp video and read pages of a book to each other. Some children also connected with friends via Google Meets, messenger apps, or online video games. However, for the most part, online peer-to-peer interactions were infrequent as they were not actively supported by the school or teachers, so social interaction for most children was limited to their parents and siblings.

6 DISCUSSION

In response to these rich description of the emergency home schooling context, we propose five design considerations so online learning platforms may be better aligned to the new role of parents, sense of place and fluidity of roles characteristic of this context. Whilst the emergency home schooling context may be regarded as a temporary response to a crisis, there is value in designing contextually relevant platforms because: (i) school closures are predicted to recur with greater frequency due to climate-related environmental crises (e.g. bush fires, floods and future pandemics) [9, 44]; and (ii) the experience of emergency home schooling has given way to new relationships between families, schools and local communities that will likely continue in some form in future and should be reflected in the design of online learning platforms.

The design considerations outlined below have been devised to reflect the relational and emergent qualities of the emergency home school context as experienced by the participants in this study. Please note that each consideration is derived from research carried out with middle class families. Further research is recommended to determine their relevance to families from other socio-economic and cultural contexts as their experience of emergency home schooling has been found to be distinct from middle-class families (e.g.[6, 13, 45]).

6.1 Supporting parents in their essential role

Parents emerged as an essential actor in the emergency home schooling, supporting their child to navigate the learning management system, access and interpret learning tasks, motivate engagement and manage the process of ‘school’ amidst a range of other competing demands. However, as expected, most parents are not trained teachers, and felt ill-equipped to meet the expectations of this new role that had been imposed on them unexpectedly. Furthermore, the material that had been provided by teachers was directed at students, and whilst it was implied that parents would support students, it was unclear what their role was and how to best support them to learn.

6.1.1 Supporting parents in scaffolding their child’s learning. Our findings demonstrated a clear opportunity to design online learning platforms that acknowledge the role of parents in the emergency home school, and their limited skills or experience with schooling. Such an approach to scaffolding online learning has been seen in established educational platforms [1]. Their absence in this context may be explained in-part by the situational constraints of the crisis. However, it may also be a reflection of the ‘black box of the school’, where parents have not traditionally been made aware of school ‘happenings’, particularly the quality of student-teacher interactions in the classroom, to minimize complications that may arise when teachers relinquish control over their teaching role [4]. In the emergency home school, however, the ‘black box’ of the school was broken open as parents were given a rare insight into the teachers practice, the quality of their relationship with their child, as well as their capacity to adapt their teaching to an online setting. It also gave parents a unique insight into the ‘teaching’ and the skills and knowledge it required, leaving many parents with a deeper respect and empathy for teachers adapting to the emergency home school, and others with a level of disappointment at how home schooling was managed.

Platforms should embrace supporting communication between parents and teachers by reducing the ‘black box’ mentality of schooling. This could be achieved firstly by providing an opportunity for teachers to share tips on scaffolding specific learning tasks, as well as personal insights teachers may have on their students as ‘learners’.

6.1.2 Supporting open channels of communication between parent and teacher networks. The role of teachers is not to ‘teach parents’, so rather than increase the workload of teachers we suggest that parents have access to a ‘teacher hive mind’ or a ‘teacher-parent network’ so parents can access a teacher, ask their question, and draw
on resources that may better support them in their role. Designers could draw influence from the informal uses of social media and online platforms (e.g. WhatsApp and Facebook groups) that parents engaged in to gather advice or resources about home schooling. These informal uses of online platforms worked for the parents in this study because they supported a localised knowledge exchange, and an opportunity to connect with other parents from their neighbourhood and child’s school. This notion of ‘crowd-sourcing’ knowledge has been applied in remote teaching contexts where student-teacher networks were established to provide additional teacher support where necessary – an approach which led to an improvement in student outcomes [33]. An equivalent parent-teacher support network would provide parents with valuable insights and support in their various roles in the emergency home school – from tech support, to resource provision and approaches to appropriately mediate and motivate their child’s learning. A network of this kind would be particularly valuable for parents with lower levels of education or limited resources.

Designers can consider drawing on established social networks to generate relevant parent-teacher networks that are sensitive to the resource constraints and cultural considerations of a particular community. We advise that online learning environments should support both a direct communication channel between parents and teachers (outside of the school channel) and the building of communication networks between groups of parents and teachers.

6.2 Designing for a new sense of place

Our findings revealed that the introduction of school to the home led to the emergence of a new sense of place, as the previous delineation between ‘school’ and ‘home’ was no longer available. Students no longer had access to their teachers or peers, or the rules, meanings and identities they attached to school institution. Similarly, the home environment was transformed as school associations were imposed. The new sense of place that emerged presented a number of considerations for designing online learning platforms and tools that are better aligned with this emergent context.

6.2.1 Embedding the constraints of the physical classroom. The use of online learning platforms led students to engage in their schoolwork in a more fluid, unstructured way at different times of the day and in various places around the home and neighbourhood. Whilst this flexibility was advantageous for many families as it enabled parents to juggle other domestic and professional responsibilities, it led some students to develop unhealthy work practices and anxiety around their progress as they did not have their peers around to gauge their progress.

Our findings indicate that preserving the sense of place and temporal structures that children associate with their traditional schooling is one approach to supporting school at home, and that considering ways to cultivate a sense of place that is distinct from the home may be supported through the design of online platforms. For instance, online learning platforms may include the temporal, place-based structures of school to support students regulate their work patterns, and recreate the sense of community students may experience when they enter the school grounds. This idea is explored in Joyner’s [21] discussions of ‘peripheral community’, which is critical to our sense of belonging, and may be cultivated in online learning environments. Joyner queries how designers and instructors can make students more peripherally aware of the presence of an online classroom community without active, direct interactions.

In contrast to current examples of virtual schools6, which are designed to support online, flexible learning for students that cannot attend a conventional school – these ‘place based’ schools can be embedded with the values, rules and structures of an authentic school context, such as allowing access only during school hours or carrying out learning in a virtual classroom. However, they may simultaneously provide additional avenues for individual expression and student-initiated creativity, such as the way they dress their avatar or their appropriation of informal ‘outdoor’ spaces during recess and lunch breaks. For example, recreating the school ‘place’ in a Multi-User Virtual Environment (MUVE) provides opportunities for students to interact directly or indirectly in a virtual classroom, fostering a sense of co-presence [25], peripheral participation [21] and place [11, 29] – all of which have emerged as valuable contributors to a child’s sense of belonging at school.

Furthermore, online learning platforms should also provide an option for families to maintain a flexible approach to schooling to ensure home schooling can be carried out around other domestic and professional demands, and parents, children (and teachers) can cultivate a healthy work-life balance according to their home situation.

Designers should consider embedding notions of place through the preservation of the structures and rhythm of school, the sense of co-presence and community, whilst enabling flexible scheduling vital to many families.

6.2.2 Leveraging place-based resources in the home and local community. Our findings revealed that in the absence of usual classroom resources, teachers regularly set tasks that relied on domestic resources that were accessible to children within and around the home (e.g. leaves for art supplies, measuring materials). Interestingly, many parents took this approach further by transforming everyday activities they carried out with their children in and around the home into an informal learning opportunity. Inspired by the introduction of the school to the home (the new sense of place), and their increased responsibility for their child’s learning, many parents saw the emergency home school as an opportunity to share their knowledge and skills with their children and connect with their home and local environments in new ways.

This presents an opportunity to develop online platforms that support the emergence of place-based social networks that promote sharing of local knowledge and resources between schools and families in a community – in effect, creating a community of practice for emergency home schooling [24]. As we have seen in recent literature, the closure of schools has amplified inequities in student access to the resources necessary to continue their education online, or the knowledge and skills necessary to support their education [6, 13, 45]. These platforms would ideally support parents and teachers develop innovative activities for students, but also reduce the pressure on individual households to support a child’s schooling.

6https://www.vsv.vic.edu.au
6.3 Designing for fluid roles

6.3.1 Design for multiple and fluctuating roles and identities in the emergency home school. As we have reported, adults and children were continuously fluctuating between different roles and identities associated with home and school life. Children were not just students in this context, they were also children, siblings, friends - and these multiple identities influenced when, where and how they engaged with their schoolwork. Similarly, parents continuously shifted between the role of parent, professional and partner, in addition to the many different roles that emerged as part of the emergency home school. Such complex and fluctuating roles and identities are not usually reflected in the design of online learning platforms. The common assumption behind a learning management system (for example) is that the ‘child’ is a learner, and the ‘adult’ is a teacher or school administrator – and they are playing these roles when they are engaging with the platform. Similar issues have been raised in regards to the ‘context switches’ or ‘context bursts’ that regularly occur when engaging in a school or professional video-chat at home [25].

Acknowledging that the roles and identities of parents and children are diverse and fluid in the emergency home school raises new questions around how these platforms may be better aligned with this context to support learning? For example, how can we design platforms to support children’s schooling when their parent is working or cooking dinner at the same time? And, is it possible for platforms to move away from the transactional forms of knowledge exchange to instead promoting different forms of social or temporal interactions more closely aligned with contemporary pedagogy?

Designers should challenge the common acceptance of remote online learning as being ‘mobile’ and ‘accessible’, acknowledging how parents and teachers roles are fluid and evolving, and how the wider context (beyond the virtual place) shapes and influences user engagement with these platforms.

7 LIMITATIONS

The findings presented in this study reflect the experiences of nine middle-class families from Melbourne, Australia. Whilst we attempted to engage a broader cross-section from within the community, families who were struggling to negotiate the sudden disruption of home schooling were difficult to access, and unlikely to have the time and resources to participate in this study. However, recent survey reports have revealed the large disparities in experiences of families across the socio-economic spectrum [6, 13], suggesting that further research is necessary to determine if and how online and digital technologies may be designed to support families with a lower socio-economic status.

Furthermore, this study was carried out during the first of two school closures in Melbourne when schools and households were in a state of crisis. It is likely that practices evolved as teachers and families became more accustomed to this new context, which has not been reflected in this study. Despite this our findings provide a valuable insight into how families respond in a crisis and have provided a unique insights into how online learning platforms may be designed for the emergency home school in future.

8 CONCLUSION

In this paper we present the results and analysis of a qualitative study carried out with nine parents and their primary school-aged children who were thrust into emergency home schooling during the 2020 COVID-19 pandemic. We specifically highlight how existing understandings of online learning platforms do not adequately align with the situational realities of the emergency home school context, including the evolving role of parents, and the new sense of place that emerges following the introduction of the school to the home. Through a discussion of these findings specifically focusing on the parents and students relationship, and associations with place, we contribute five considerations for the future design of platforms to support online learning in these contexts.

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ChI’21, May 8–13, 2021, Yokohama, Japan

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