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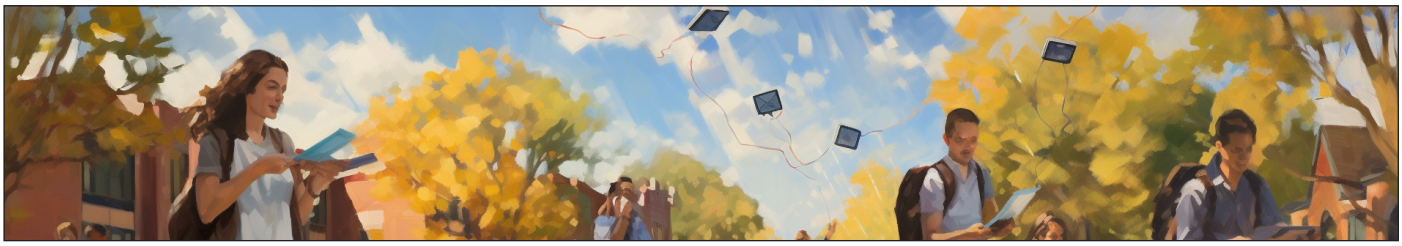

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Virtual connections for parental engagement: What do digital spaces offer?

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Abstract

The engagement of parents in their children's education is a well-established expectation in many countries. However, pressures on time and resources (in classrooms and homes) threaten the communication that is a fundamental element of that engagement. This article examines the potential of digital technologies for parental engagement by focusing on the popular e-portfolio app Seesaw and drawing on Harrison's (2018) analytical framework for the spatial analysis of learning spaces. It focuses on how the Seesaw platform transforms ordinary routines of parental engagement and how teachers and parents make sense of and negotiate these transformations. It is based on observations in a single case study school, which is state-run, English-medium, urban, and co-educational, with a diverse socio-economic community in Aotearoa New Zealand. The analysis draws on data from semi-structured interviews (n=6), specifically on the use and experience of Seesaw of three teachers and three parents (one from each class). These were supplemented with transcripts from semi-structured interviews (n=21) of staff and parents from a broader study on parental engagement. Findings show there are opportunities for teachers using the Seesaw app to enhance communication between school and home, increase and sustain parent-child learning conversations, and support parent-teacher partnerships for learning. The article concludes, however, that without a clear purpose following principles of parental engagement and supportive training and guidance, schools

risk replicating and perpetuating well-established parent subjectivities, where schools retain agency so that parental engagement in learning is not maximised.

1. Introduction

Education policy in many countries highlights the value of parental engagement and the importance of educational partnerships between teachers and parents (e.g., Australian Institute for Teaching and School Leadership, 2018; Education Council of Aotearoa New Zealand, 2017; Ontario Ministry of Education, 2010). Research has indicated that engaging parents in their children's education is beneficial for educational outcomes (Hattie, 2009; Hong & Ho, 2005; Jeynes, 2005). The parent-teacher relationship has typically been envisaged in the physical sense — on the school campus and using face-to-face and newsletter communication. Following developments in digital technologies (including platforms and apps), new virtual spaces provide additional relational spaces. To date, there has been little in the way of spatial analysis on the merits of these for enhancing parental engagement.

This article suggests that digital spaces, such as the one provided by Seesaw, offers opportunities to enhance communication between school and home, to increase and sustain parent-child learning conversations, and to support parent-teacher partnerships for learning. For these benefits to be realised, schools and teachers must determine a clear purpose (following principles of parental engagement) for efforts in this digital space, and work with students and their parents. Without this, there is a risk of replicating and perpetuating problematic parent subjectivities, where schools retain agency (and power) within the home-school relationship so that parental engagement in learning is not maximised. The article begins by introducing the scholarship on parental engagement and education technologies and presents an overview of the Seesaw app through the lens of spatial analysis. The section following presents the case for a spatial perspective to digital spaces and the research method. The spatial analysis is then organised under the three main headings of the analytical framework, and the article finishes with discussion and conclusions.

2. Parental engagement

Early research into parental engagement can be traced to Epstein's model of participation which occurs largely within the school environment and at the direction of the school (Epstein & Becker, 1982). More recently, scholars have distinguished between 'involvement' and 'engagement' (Goodall & Montgomery, 2014) and the latter's potential to contribute to student achievement through parental expectations and communication about learning (e.g., Borgonovi & Montt, 2012; Hattie, 2009; Hong & Ho, 2005; Jeynes, 2010). Parents, however, are not always positioned in ways that recognise or value that potential. Contemporary conceptualisations of parental engagement position parents as consumers or governors, alongside traditional notions of supporters and co-operative receivers (Smith, 2020). For schools, parents who do not fit a narrowly prescribed role or subject position — that typically features overt actions and particular ways of communicating — can be labelled "hard to reach" (Crozier & Davies, 2007). And, for some parents, teachers and schools can seem inaccessible due to how they are structured, their built space (Smith, 2022), or 'otherness' in terms of values, ethnicity, and expectations (frequently of a white, middle-class nature (Crozier & Davies, 2007)).

Parents who do not start with the same resources or cultural capital for engagement are at a disadvantage and may experience less "effective communication and mutual understanding" with teachers (Marschall & Shah, 2020, p. 703). This hampers the creation of successful educational partnerships of which "timely two-way communication" is seen as a key feature (Bull et al., 2008). In addition, while many parents often come into the school when their child is young, that naturally decreases as the child gains independence. Digital spaces and technologies open up opportunities to overcome and address some of these barriers through social media apps (Baxter & Toe, 2021) and digital platforms, diversifying communication by connecting "to families in the online spaces where they "live"" (Gustafson, 2018, pp. 27-28) and enabling more frequent and personalised communication (Kraft, 2017) of learning progress (Higgins & Cherrington, 2017).

3. EdTech (educational technologies) and parental engagement

Digital technologies and virtual spaces have become increasingly ubiquitous, with 66.6% of the global population being mobile telephone users, 59.5% Internet users, and 53.6% social media users (Kemp, 2021). Unsurprisingly, these technologies are used for diverse purposes within education, including communication (Gustafson, 2018), enhancing teaching and learning (Comi et al., 2017), behaviour management (Manolev et al., 2018), distance learning (Ames et al., 2021), e-portfolios (Besse, 2017), and parental engagement (Baxter & Toe, 2021; Lewin & Luckin, 2010). However, the use of digital technologies does not

necessarily alter underlying processes or existing imperatives (Selwyn, 2011). Issues of digital inequalities have long been a concern, but beyond the matter of access, the focus has shifted to the differential nature and use of technology both inside the school and the home (Comi et al., 2017; Crang et al., 2006).

Communication is a fundamental aspect of many EdTech developments concerning parents. Not only is regular information sharing a crucial step in establishing successful partnerships, but some schools are using technologies to try and reach parents who do not, or cannot, come to the school campus (Bull et al., 2008, p. 9). EdTech developments include the growing use of mobile and digital modes of direct communication between schools, teachers and parents (Kraft, 2017), for example, through posts and direct messaging via social media, emails, and text messaging (Bordalba & Bochaca, 2019; Gustafson, 2018; Thompson et al., 2015). Learning and behaviour management systems also allow direct communication with parents (Laho, 2019). Some EdTech platforms also offer translation functions (e.g., ClassDojo), providing new opportunities to reach linguistically diverse parents. These technologies expand options for reaching parents beyond the physical school space while also removing the need for human intermediaries (e.g., children taking printed documents home).

Beyond the need to communicate with parents about administrative matters and general school information, communication occurs to engage parents in the education of their child. Jeynes (2010) described communication between parent and child about school as a critical aspect of effective parental engagement; technology offers direct, real-time communication to parents of what occurs in the classroom. The information provided in this type of communication can form the basis of richer conversations between parent and child (Higgins & Cherrington, 2017), particularly when the child can make decisions about the content shared (McLeod & Vasinda, 2009). This communication can occur informally (e.g., using Instagram, see Hutchison et al., 2020, p. 175) or more formally through e-portfolios.

E-portfolios are perhaps among the most familiar applications for digital technologies in education (see, for example, Seesaw, **https://web.seesaw.me/)**. Established in early childhood education (ECE), they are now increasingly utilised in primary schooling (McLeod & Vasinda, 2009). E-portfolios are typically digital versions of learning stories or journals, an important form of ECE assessment (Beaumont-Bates, 2017). There can be multiple purposes for e-portfolios, but they centre on documenting and reflecting on learning and sharing learning with key others (e.g., parents) (Te Kete Ipurangi, n.d.-a). They offer that 'real-time' window into what is occurring in class, providing an enriched basis for conversations about learning between child-teacher-parent (Higgins & Cherrington, 2017). Children often make decisions about the contributions to their stories which include "descriptions of [their] learning activities, dispositions, actions, and working theories, and [may] include a teacher commentary about possible next steps for learning" (Cowie & Mitchell, 2015, p. 126).

3.1 Risks, issues, and concerns

As researchers like Mariën and Prodnik (2014) have indicated, despite the rhetoric of openness, empowerment, and inclusion around digital spaces and EdTech, there are associated limitations, risks, and barriers. Notwithstanding steadily improving access to the Internet and devices, the digital divide still features as a barrier to some households (Hébert et al., 2020), which has been exposed further during the Covid-19 pandemic (e.g., from New Zealand, see Digital.govt.nz, 2021; Education Review Office, 2020). Digital inclusion issues are social by nature (Bonne & Stevens, 2017; Mariën & Prodnik, 2014), and the 'new' digital divide, centred on the use and possibility of beneficial outcomes rather than access (Crang et al., 2006; Ragnedda et al., 2019) highlights further advantages the wealthy can leverage (Hébert et al., 2020; Huang & Lin, 2019).

Digital spaces are not always safe, and some technologies (including web portals, online platforms, and apps) have created new avenues for perpetrators of family violence, for example, to monitor and harass (Bogle, 2018). Further ethical concerns exist, such as the positioning of students as subjects (Lindgren, 2012), the surveillance of students (Manolev et al., 2018), and potentially parents and teachers. Security of private data is also a concern, as is the control and use of data collected (Singer, 2014).

Finally, the market imperative of EdTech generates concerns about the role of private enterprise in schooling (Wright & Peters, 2017) and the platformisation of education, whereby "EdTech providers and technologies are key cultural, political, policy and economic players" (Grimaldi & Ball, 2020, p. 2). EdTech generates substantial revenue for providers and is considered a growth industry, where game-based developments have helped to drive a 40% share in industry global revenue for the K-12 sector (ages 5-18 years) (Grandview Research, 2023, para. 15). The technologies developed are promoted as offering 'learning solutions' that solve the 'problems' of classroom-based learning, delivering the concomitant educational setting for children who are 'digital natives' (Grimaldi & Ball, 2020). This can

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result in the influence on learning by providers of EdTech being outsized and (perhaps on the part of educators) unwittingly allowed through the development of educational conventions, social norms, space-time frames (Decuypere, 2019), and epistemology (Gillespie, 2010) beyond what was intended.

3.2 About Seesaw

The EdTech platform used in the case school in the study reported in this paper was that provided by Seesaw Learning, Inc., a private, San Francisco-based company. Growing out of a prior app (Shadow Puppet, released 2012) created by the co-founders, the idea for Seesaw (released 2015) responded to the way teachers were using the multi-media tools Shadow Puppet provided with their students (Clifford, 2020; Lagorio-Chafkin, 2020). Seesaw co-founders reported that the company would be profitable in 2020 (Clifford, 2020).

Seesaw is an app-based programme that began as a digital learning portfolio for students whose aims included:

- Empowering students to take ownership of their learning and to reflect on their progress over time.
- Inspiring students to try their best by providing an audience for their work beyond the classroom.
- Creating a meaningful home-school connection so families can better support their child's learning.
- Supporting …educators. (Seesaw, 2018, para. 2)

With the Covid-19 pandemic, the app has evolved into a broad-based learning platform as teachers used it to manage remote learning — this saw the number of Seesaw's paid customers triple and a tenfold increase in student posts (Clifford, 2020). Seesaw is now used in 150 countries worldwide and is in 75 percent of schools in the United States (Albertson, 2021). There are different levels of access: a free version for students, teachers, and parents; Seesaw Plus (individual teacher subscription); and Seesaw for Schools (school/district-wide subscription) (Seesaw, 2021a). The Seesaw Class app is used in the classroom by teachers and students, where teachers can also manage interactions by all other users (students and parents). The Class app is free to download and use on the basic plan and has high functionality with all the Seesaw basic classroom level functions. Additional plans expand the functions available, particularly across school(s) (**https://web.seesaw.me/seesaw-all-plans**). Parents use the Seesaw Family app (free to download and use) to access to their child's portfolio.

Beyond replacing traditional communication achieved through email or paper-based modes, Seesaw, as a digital portfolio, has designed a space for a conversation about student learning between student, teacher and parent. With push notifications when their child (or the teacher) posts on the private online platform, parents do not need to initiate contact. They can access posts via their telephone, tablet or computer. The user interface mimics familiar social media platforms and allows similar responses, such as 'likes' and comments. For parents, Seesaw posts offer real-time insight into the classroom and what their child is learning, to inform conversation when the child gets home. Potentially, what a child undertakes at school "is more blended into their family life, …[where] a photo of their swirly flower art project, done at a desk miles from home, also gets a view on Daddy's phone and sparks a conversation over spaghetti that night" (Lagorio-Chafkin, 2020, para. 15). There are limited studies on the application of Seesaw. Examples include Moorhouse and Beaumont (2019), who examined its use for involving parents in their child's language learning; Baxter and Toe (2021), where Seesaw was one of three social media platforms used for family engagement; and, finally, Kurnava and Sellhorn (2018) who investigated its effectiveness for delivering parent education for parental engagement.

4. Bringing a spatial perspective to the digital world

Virtual space generated by digital technologies offers the potential to overcome some of the traditional constraints to parental engagement. The new technologies have created new spaces that have potential to overlap and complement traditional spaces for parental engagement (Grant, 2011; Harrison, 2018). As it is, schools were not typically designed to facilitate parental engagement and enact teacher-parent partnerships (Smith, 2022).

However, like built spaces, virtual space is neither 'empty' nor neutral; it is a product of the interaction between technological design and the user, both of which are informed by assumptions on purpose and practice. Space is "produced" and "rendered meaningful" by socialised practices (teaching, filming, taking photographs, posting, commenting) which take place in material environments (networks, devices, classrooms, and home and work spaces) (Kuntz & Berger, 2011, pp. 245-246). The productive nature of digital technologies structuring "social activity" through the coding and algorithmic processes of the designers highlights one aspect of how virtual spaces are an interplay between technology, humans and social relations (Williamson, 2012, para. 6-7). This interplay is reiterated in the presentation of digital

spaces as "fluid sociomaterial assemblages" the product of "people and things—both online and offline" (Thompson, 2014, p. 542), and as such, shaping and being shaped by diverse groups and individuals.

Simplistic spatial metaphors like 'open' and 'closed' (e.g., built space is closed, virtual space is open) are problematic (Harrison, 2018). Viewing virtual spaces as inherently open, accessible, and democratic, for example, is simplistic and can overlook how they can create alternative kinds of exclusions and barriers (Mariën & Prodnik, 2014; Oliver, 2015). Resisting these binaries allows consideration of what Boys (2011) visualises as the dynamic "horizontal" relationship between space and the activities undertaken made up "of intersecting, complex and partially related processes". Oliver (2015, p. 373) suggests we can then consider how boundaries to desired activities, such as parental engagement, can be overcome or are 'permeable.' This consideration must understand what kinds of openness or access is appropriate or needed and suited for diverse users (p. 382) and how different technologies might assist those aims. Finally, Harrison (2018) argues that the perceptions of students, parents, and teachers "will influence how they both use and enact their spaces over time," and therefore a more nuanced understanding of the "relationships that happen within our designed spaces" is appropriate (p. 23).

There is potential in emerging models to adopt a more advanced analytical framework for examining the spatial dynamic in educational contexts. Boys (2011), for example, has articulated a framework that links "material space and its occupation as learning" (p. 56). This framework for the analysis of "socio-spatial practices" (Boys, 2011, p. 56) is grounded in Lefebvre's (1991) *spatial triad* of spatial practices, representations of space, and representational space. Boys (2011) articulated from this a trio of parallel running threads that could represent the complexity, partiality, and at times, conflicting nature of socio-spatial practices (1), within specific designed contexts (2), and the perceptions and engagement of participants with and between them both (3) (p. 63). Harrison (2018) has adapted Boys's (2011) model to offer a framework of three threads that analyses how users (e.g., teachers, learners) "negotiate and enact" *digital* spaces (representational) "by exploring the inherent gaps and contradictory tensions that arise between design space (representations of space), and the ordinary routines of learning (spatial practices)" (Harrison, 2018, p. 26). This framework offers a way of analysing how we conceive and perceive digital space for parental engagement purposes and if our intentions for their use are effective.

5. Method

This article draws on a case study examining how parental engagement policy is enacted within primary schooling in Aotearoa New Zealand (AoNZ) (Smith, 2020, 2021, 2022). The study is particularly concerned with the impact of context on this enactment. It is a single bounded case, identified here as Korimako School. The case school selection being purposive given, it is a relatively typical representation of a primary school in AoNZ, being English-medium, urban, co-educational, state-run, and serving a broad socio-economic community (as identified by the Ministry of Education).

Like many schools in AoNZ, and elsewhere, Korimako had been growing its use of digital spaces and educational technology for both learning and interactions with parents. The school had recently started using Seesaw software, and as several teachers and parents expressed positive opinions about the app, I wanted to analyse how digital space through an educational technology like Seesaw might enhance parental engagement. Three existing parent participants volunteered to undertake a semi-structured interview that focused on their experiences with Seesaw with their child (if they had more than one child, they chose one to focus on). I also conducted a semi-structured interview with that child's teacher, with each teacher working at a different teaching level within the school. The Seesaw participant groupings and their year levels are as follows: Snake (Year 2, ages 6-7 years), Tiger (Year 3-4, ages 7-9 years), and Mouse (Year 7-8, ages 11-13 years). In addition, the analysis drew upon semi-structured interviews with other staff and parents (n = 21) about parental engagement.

Using NVivo (a qualitative analysis programme), I analysed the transcripts for relevant themes drawn from my adaptation of Harrison's (2018) framework (see Figure 2). My framework for analysing digital learning spaces has been adapted to examine the digital space designed by Seesaw and used for parental engagement. Attention is focused: firstly, on existing parental engagement practices (ordinary routines); secondly, the processes and functions of parental engagement practices as designed and organised by Seesaw (design); and thirdly, how the ordinary and transformed routines of parental engagement are perceived and enacted by users (negotiated perceptions and enactments). Finally, the tensions, gaps, and contradictions that occur within and across the framework's three threads are considered as part of the complex and partial processes of the design and use of digital space.

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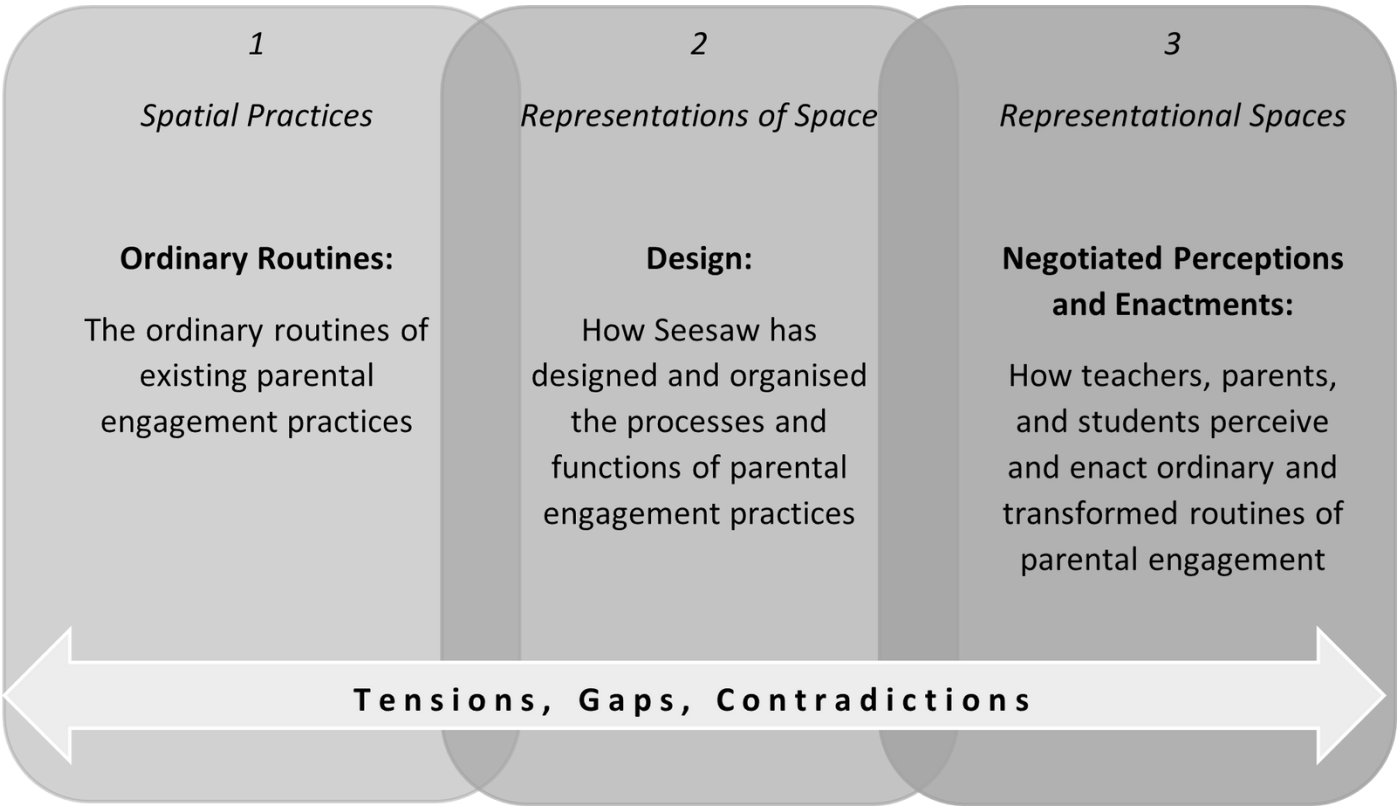
Figure 1. Framework for spatial analysis of Seesaw as a digital space used for parental engagement: Adapted from Harrison (2018)



6. Spatial analysis

My adaptation of Harrison's (2018) framework focuses on enacting parental engagement in the digital space designed by Seesaw. It is against this framework that the interviews with teachers and parents are analysed. The analysis is presented following the headings of the framework: ordinary routines; design; negotiated perceptions and enactments; and within and across those, the tensions, gaps, and contradictions observed.

6.1 Ordinary routines of parental engagement

This first space that Lefebvre (1991) described as *spatial practice* — the first third of the framework — "produces relationships to people, things, practice, and places of practice" (Sheehy, 2009, p. 145). It is here that policy, theories, and activities of parental engagement; teachers, students, and parents; and the built environments of home and school develop relationships and practices. These are the *ordinary routines* (Boys, 2011; Harrison, 2018) of parental engagement that produce and reproduce relations and subjectivities between and of teachers and parents. This space was also called 'perceived' space by Lefebvre (1991), as ordinary routines are perceived as 'natural' and what is expected (Sheehy, 2009, p. 145). The analysis draws on what teachers and parents perceive as parental engagement — its relations and activities.

Education policy is a significant contributor to the everyday practices of parental engagement, as it establishes some of the 'taken for granted' understandings about parents and their role in education. For example, in AoNZ, reporting to parents is mandatory (Minister of Education, 2017), and teachers and parents accept that parent-teacher interviews and written reports to parents on student progress are ordinary routines. Formal reporting represents one aspect of the 'everyday' communication practices between schools and parents employing two traditional mediums, face-to-face and written hard-copy. Many schools also utilise learning journals, portfolios and e-portfolios for learning and assessment, contributing to real-time reporting to parents (Te Kete Ipurangi, n.d.-b). Newsletters and ad hoc notes are routine communication practices, typically via electronic mediums,

such as email. Communication and reporting practices are routines in support of the learning partnerships sought (Bull et al., 2008; Epstein, 2018; Hornby, 2011), where parents are *partners* in education (and for more on subjectivities of parents, see Smith (2020) and following).

A genealogical study of parental engagement in AoNZ (Smith, 2020) found that the subject positions for parents were dominated by subjectivities that emerged with the policy reforms of the 1980s, situating parents as *consumers* and *governors*. As consumers, key activities for parents are taking responsibility for their child's educational achievement and holding teachers to account. The subject position of a governor is strongly related to the mandatory involvement of parents in the governance of individual schools through a board of trustees. Policy discourses express these subject positions, and they are reproduced in the perceptions and actions of teachers and parents. For example, teachers and parents perceive a need for parents to be proactively engaged and to approach the teacher and the school. Face-to-face interaction (formal and informal) between teacher and parent is an expected form of communication. The invitation — or expectation — for parents to come into schools is often expressed in an 'open door policy' that, for many schools, is the normative approach to parental engagement (for example, see Ashton & Cairney, 2001; Hornby & Witte, 2010; McKay & Garratt, 2013; Ministry of Education, 2013; Smith, 2021).

Other, long-standing parent subjectivities are evident in parental engagement, and one, *parents as co-operative receivers*, is strongly linked to routine school communication practices. The *co-operative receiver* subject position describes parents as "recipients of generally unidirectional expectations, communication and information" on the assumption these will help the parent better support their child's learning and the activities of the teacher or school (Smith, 2020, p. 12). Routines of information sharing encompass items such as portfolios of work, assessment results, and notices about units of study and events in the class or school. Communication may also address teaching techniques (e.g., for reading or mathematics) used by the school or that the school would like parents to use at home (e.g., in support of homework programmes).

Finally, the subject position of *supporter* has been dominant in the spatial practices of parental engagement since formal schooling began (Smith, 2020). Parental support for their child and the school is a "typically expected and generally forthcoming behaviour" (p. 11). Parents express this support through parent help roles (e.g., helping prepare resources, coach sports, listen to readers, attend camp), participation in parent-teacher groups or committees, and assistance with fundraising. These activities are a form of 'active volunteerism' as parental engagement; however, they are frequently only undertaken by parents with 'sufficient capital' to do so (Martin & Vincent, 1999, p. 144).

These examples of the ordinary routines of parental engagement are not exhaustive but serve to illustrate everyday practices of home and school. The routines reveal some of what the adapted framework describes as 'tensions, gaps, and contradictions'. Family-school relationships through traditional means of formal and informal communication and interactions (and other subject positions) are well established and accepted (Hipkins & Cameron, 2018), challenging both teachers and parents when trying to create the sought after educational partnership model (Education Gazette editors, 2018). The impact of the built space of schools is often in tension with the desires or expectations of parental engagement routines (such as open-door policies) (Smith, 2022). Parents are not homogenous, and differences in culture or socio-economic group can create gaps between what is expected and what is appropriate (Lareau, 2000; Murphy & Pushor, 2004). Other routines (e.g., in-class support) are often gendered, with expectations for how mothers engage and take responsibility for their child's education being higher than fathers (Vincent, 2017). Finally, many of these ordinary routines of parental engagement ignore salient factors for improving student achievement (Jeynes, 2018).

6.2 Designed transformations within Seesaw

Lefebvre (1991) described the space denoted by the second third of the framework as *representations of space* conceived by experts such as architects or programmers in digital spaces. This space represents the *spatial practices* or *ordinary routines* perceived in the preceding section by organising them around "specific conceptions of knowledge" and, as such, is a production of power (Sheehy, 2009, pp. 146-147). However, drawing on Boys (2011), Harrison (2018) expands this idea by conceptualising educational space in the *design* third of the framework, as not only being "inscribed" by experts (e.g., teachers, programmers) but by anyone (including parents and students) trying to make sense of their world using space — "conceptual, material, social or personal" (p. 23). Specifically, the space is a representation of "attempts at specific designed transformations of [the] 'ordinary' routines of learning" (Boys, 2011, p. 56). For this article, the focus is a space designed by Seesaw where aspects of parental engagement (in the form of school-home communication and learning portfolios) are organised and 'made sense' of. In this attempt, Seesaw

experts (programmers and designers) have drawn on or responded to user feedback (Clifford, 2020; Lagorio-Chafkin, 2020). Seesaw was initially designed as a student-led digital portfolio, and when I conducted the interviews with teachers and parents, this was the basis of their use of the app. Since then, the global Covid-19 pandemic has shifted how teachers use Seesaw, and it has developed more fully into a learning management system. The designed transformations analysed in this section are identified by parent and teacher participants and promoted by the creators, focusing mainly on its application as a digital portfolio and communication platform. As such, the ordinary routines of parental engagement that have been transformed relate particularly to reporting and communication, and impact the subject positions of parents as co-operative receivers and partners.

As an e-portfolio, Seesaw enables students to demonstrate and reflect on their learning and collate and share this with their parents in a digital space. E-portfolios are also one way that teachers share information for parental engagement. Several features have been designed to transform how this occurs and differ significantly from traditional, hard-copy portfolios. Firstly, the type of work and how it can be shared have been expanded. In addition to uploading hard copies of work completed, Seesaw allows for photographs, video, audio, drawing, linking, writing, or a multimodal combination. According to Seesaw (2021b, para.3), these tools allow students to "show what they know in the way that works best for them" enabling flexibility for the user (e.g., students can choose to write or verbally narrate their learning). The tools of the digital format can support student agency (McLeod & Vasinda, 2009). Further, this has expanded the type of learning content students and teachers can capture to include learning parents would previously have to be physically present to experience, such as speaking or swimming. Following media richness theory, this highlights the "informational richness" (Guydish & Fox Tree, 2021) of the Seesaw mode of communication that contrasts with traditional modes (where the purpose of the communication is to share student learning with parents).

Seesaw has transformed the volume of items that can be collated far beyond that of any hard-copy system so that students can develop a significant portfolio over time. As the designed space allows for the easy sharing of a high volume of multimodal messages and posts, teachers can also share different information with parents. For example, there is the opportunity for teachers to share a video showing how to complete a mathematical process or show an exemplar for a homework activity. Jeynes (2018) suggests that schools can model salient factors for raising student achievement to parents, e.g., valuing education, having high expectations of students, and how to support learning at home. Seesaw has designed a space where this type of modelling can occur.

Further to the designed flexibility of modes (e.g., audible, written, visual), Seesaw has transformed communication and reporting possibilities by facilitating the translation of most written text into the language setting of the device in use (https://bit.ly/seesaw_translation). This transformation allows linguistically diverse parents to access their child's learning and teacher feedback. In turn, the parent's contribution in their own language, via comments and messages, can be translated for the teacher. There are currently over 55 languages available for use.

Seesaw's transformed communication routines with parents have provided students with an 'authentic audience' for their work beyond the classroom (Dillon, 2015). Being part of an authentic audience also gives parents greater insight and understanding of their child's learning progression. This is facilitated by work being shared in 'real-time' (notified by push notifications) and by Seesaw providing the opportunity to provide feedback (via 'likes' and comments). Combined, aspects of the transformed routines, such as real-time sharing, notifications, translations, and being an authentic audience, have transformed how parents initiate conversations about learning with their children by allowing timely, informed questions and discussion (Baxter & Toe, 2021; Lewin & Luckin, 2010).

I conclude this section by examining the key 'tensions, gaps, and contradictions' of the designed transformations. Perhaps the most evident significant gap is what parents can do from the Family app. For example, while Seesaw is designed to allow teachers to message parents directly, currently, parents cannot initiate a message to a teacher (**https://bit.ly/seesaw_parentmessaging**). Parents are also unable to post to the portfolio; this means that a child cannot share their learning occurring at home via their parents and the Family app (https://bit.ly/seesaw_parentpost). This functionality gap is in tension with the aims of parental engagement, particularly where parents are positioned as partners in education, as it continues unidirectional (school-home) information sharing reducing the dialogue potential of the app. This is also a general concern with digital technologies for school-home communication (Goodall, 2016). Hipkins and Cameron (2018, p. 44) identified that while digital technologies are successfully used in real-time reporting, they did not find evidence that two-way digital collaboration was common between home and school. Further, this impediment to reciprocity maintains the power imbalance between school/home and teacher/parent by valuing what is school-based over that which is home-based.

As with any system or "knowledge infrastructure", there are important considerations about power and ownership, at user, designer, and system-levels (Buckingham Shum, 2018; Hipkins & Cameron, 2018). For example, how does the increasing use of digital technologies in schools influence education's values, beliefs, and purpose? Does educational technology contribute to the "privatisation of… education by stealth"? (Wright & Peters, 2017, p. 174). Buckingham Shum (2018) raises questions about ownership of data, the role of stakeholders and users in the design process, and how users, researchers, and others maintain a level of mindfulness about this type of digital infrastructure (given how readily, as designed space, it becomes a "taken-for-granted backdrop" (Yanow, 2014, p. 369; Hipkins & Cameron, 2018, p. 45). We (all stakeholders) must be mindful of the "hierarchies, roles, and rules [that] are perpetuated and replicated in our digital spaces" (Harrison, 2018).

6.3 Negotiated perceptions and enactments

Lefebvre (1991) presented this third and final space, *representational spaces*, as oppositional to the second *representations of space*. Representational spaces are where "ordinary people seek to appropriate and/or transform the normative representations of space made by [experts]" in the second space (Boys, 2011, p. 55). As per the last section, these activities are also a form of meaning-making, but this time through the *negotiated perceptions and enactments* of ordinary and designed routines of parental engagement by teachers, parents, and students. By adapting and working to make the designed space fit their needs, the users "inscribe different meanings" (Harrison, 2018, p. 24). The practices through which users transform and enact the routines of parental engagement are drawn from interviews with parent and teacher participants and are limited here to two main interrelated themes, communication and posting and commenting. The *communication* theme examines how the Seesaw space is perceived and utilised for communication with parents in practice. The *posting and commenting* theme considers the practice of posting, its purpose, and the responses it elicits from parents.

6.3.1 Communication

Communication is central to any relationship and supports effective parental engagement (Jeynes, 2018). Participant quotes highlighted how designed transformations positively impacted their practices. Transformations included timeliness ("the parents… they get notified straight away"), and the ability for posts to go directly to parents via the Family app ("[it] is good because it comes straight to [parents] and you can see them in real-time commenting"). Other relevant aspects offered by Seesaw include the ease of use ("a great thing about it is it's so easy on a smartphone") and the ability to see inside the classroom ("it's like you're in the class with them"). Two final communication routines that parents and teachers perceived as transformational related to the relationships the communication fosters and its purpose (e.g., reporting). I now consider these in more detail.

Information is a core requirement for evaluating student progress, by teachers, students, and parents. Teachers are responsible for reporting to parents on student progress (mandatory in AoNZ, see Minister of Education, 2017), and both teacher and parent participants from Korimako School had come to perceive Seesaw posts as transforming those routines. Many participants believed that parents gained insight from the regular, individualised, Seesaw posts that also supported formal reporting. The posts support the type of quality information for effective parent outreach — regular, individualised, and ideally including how parents might support the learning at home (Baxter & Toe, 2021; Kraft, 2017). One parent explained how she perceived the posts supported formal reporting:

> you only get 15 minutes with those face-to-face [interviews], if you've already seen the [posts], you've already been able to form your questions, and have them ready to ask, then you're not spending that whole time getting the information, and then run out of time for discussion.

The teacher participants were trialling Seesaw and negotiating how information shared through Seesaw related to their formal reporting processes. One teacher highlighted the tensions they were negotiating between the initial intentions for Seesaw (to replace physical portfolios) and the overlap with the formal written reports:

> it was pretty much always just a replacement [for the hard-copy portfolios]— there was no change in the expectations. It was always one sample per term, per curriculum area. And to put a comment… Whereas I feel like we are, at this stage, [doubling-up]… because you're writing a comment which also is your report comment. Because you're normally putting it on [the] final piece of work, it's pretty much the same as what you would write in the report. [So, the purpose of the comment is to be informative and value-added for the parent], and they have started talking about doing the Next [Learning] Step [which is usually in the written report].

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Finally, parents and teachers perceive that the type of communication enacted as a result of using Seesaw posts provides a new, richer picture to parents of what their child is doing at school. Jeynes (2018) describes supportive and informative communication as a crucial element of supportive learning relationships, and participants see transformations in parent-child relations. One staff member described a change he had observed:

> parents are so enthusiastic about their kids learning and the sorts of things they are celebrating in, for want of a better word, digital public…They are actually publicly praising their kids, now [there] are the parents that would also praise their kids in a crowded room, but there are some that are going "WOW, I didn't know that you could do this, wow, this is…" and it's the stuff you would never get in a written report… you'd never get it in a parent conference.

This observation is indicative of the shift toward more salient parental engagement by, for example, increasing the expectations parents have for their child's educational achievement (e.g., Jeynes's (2018) *high expectations*).

6.3.2 Posting and commenting

The breadth of content shared with parents in 'real-time' has been transformed by Seesaw. For example, one teacher described how it allowed her students to better share their language learning with parents:

> [Previously] you had to get them to write down the Māori — but Māori's supposed to be an oral language — and so now I can film children having a conversation… so I think that shows their true understanding. Whereas [before] if they're… low in writing that affects their ability to show what they can do in Māori.

Teachers also described how the social development of students was becoming more visible using Seesaw. Staff reported that this was something frequently prioritised by parents but previously challenging to convey or report on. Through video posts, parents saw their child in group interactions, for example, or how they conducted themselves in class. Further evidence of developing social skills was available through the option of peer commenting, something particularly noted by teachers and parents of senior year level students.

The purpose of the posts created on Seesaw was something teachers were still negotiating through their practice. This was also found in other case studies and was a point of reflection and discussion in reflective practice meetings (Baxter & Toe, 2021). Several Korimako teachers discussed the need for a clear purpose for Seesaw to be identified and adhered to school-wide. While the principal clearly articulated that using Seesaw was a replacement for previous portfolios (and as such would contain samples of (typically best) work), teachers had discovered other purposes through their practice, and its use was noticeably varied amongst them. One teacher thought posts could be utilised to demonstrate a more "authentic indicator" of student progress to parents by requiring more selective and consistent sampling at certain times of the year (e.g., a writing sample of set criteria at the beginning and end of each term). Another teacher identified the potential for posts to encourage repetition and practice of what they are learning in class and reiterate key feedback. Agélii Genlott et al. (2019) propose that teachers retain a degree of flexibility in the approach and use of digital technology for it to be sustainable. They recommend teachers develop and participate in social systems beyond the small environment of a single school (e.g., Seesaw teacher communities on Facebook) to foster "actively shared practice" which can support diversity amongst teachers (e.g., in uptake and skills) (p. 2034).

The final point of consideration for this section is commenting on posts. What Seesaw offers for parental commenting or feedback on student work is relatively new for parents in its scale and regularity. Teachers found that this was an area parents were still navigating, with some responses limited to 'likes', while others offered richer, more constructive feedback. Other researchers have also observed this (Moorhouse & Beaumont, 2019). At Korimako, commenting and its purpose were still being negotiated between teacher-teacher and teacher-parent, which speaks to the unclear purpose of the posts. One teacher noted, however, how parents were starting to respond to and model their comments on those of teachers:

> At first it was a lot of, kind of what you expect from a [beginning teacher], "well done", "good work son"… that type of thing, but now it's already developed into a lot of "I hope you listen to your teacher's feedback and act upon it" or "you've done a really good job using descriptive language, but we really need to spend some time at home working on punctuation and spelling".

The modelling potential, teacher-to-parent, is a progression of development that could be aided by support information and clear expectations for comments (e.g., see Paramata School, 2019).

6.4 Tensions, gaps, and contradictions

Several tensions, gaps, and contradictions were observed in the enactment of parental engagement using the digital space afforded by Seesaw. A gap was perceived between what teachers practised or felt they needed to practice with Seesaw and their access to technology to support that (for example, "if they all had an iPad then that would be fantastic, and I think there'd be a lot more work on Seesaw, but with just two it's quite hard"). The cost was also a factor in an additional source of tension, where some staff were wanting to access the full range of features Seesaw has designed (for example, "we're trying to convince the board that we should go for the paid version… there's quite a bit more you can do with it").

Two central tensions have been indicated in the previous paragraph through ongoing negotiations in practice. Identified through the analysis and by participants is the realisation of the potential of Seesaw posts to engage parents in a way that is agentic for parents (relating to parental engagement with children's learning on the Goodall and Montgomery (2014) continuum) and supportive of the most salient forms of parental engagement (which are home-based, as per Jeynes (2018)). Tensions arise from the design of the Seesaw Family app and the purpose — and therefore content — of the posts made to portfolios by children and teachers. Further to what has already been discussed, the gap in the Family app design is now considered.

The Family app used by parents does not have the same functionality as the Class app, and posting is not possible. While a child may log on to their account via the Class app at home, this can be harder to achieve with young children who may use a QR code (instead of an email address) to log on in class. As one parent described:

> I was telling my son's teacher how he read a book… it was a big chapter book. She said, 'Oh, you should put that on Seesaw'. Well, the parents can't post anything themselves, and so it would be great if it was a two-way communication tool.

With remote learning during the Covid-19 pandemic, students have become more familiar with logging on at home, and Seesaw has subsequently designed a *home learning code* (**https://bit.ly/seesaw_homelearningcodes**) that allows secure non-email logons by students to the Class app. Teachers and schools also need to be cognisant of how posts can perpetuate a belief that learning is school-based when restricted to school-only posting and content (Baxter & Toe, 2021). Further, it stifles the *dialogue* (where both teachers and parents give and receive information) that is instrumental to developing an educational partnership between parent and teacher and the self-efficacy parents need to effectively engage with their child's learning (Goodall, 2016). This is a gap in the functionality of the Seesaw Family app.

Table 1. Responses made by parents to posts individually identifying their child

Parent	Child year group	Percentage of posts with	
		'Likes'	*Comments*
Snake	Junior school: Year 2	53	20
Tiger	Middle school: Year 3/4	90	33
Mouse	Senior school: Year 7/8	70	1

The aforementioned negotiations on purpose and content express the tensions in educators' uptake of new technologies (Agélii Genlott et al., 2019). A related concern is a gap in uptake and use by parents. Lack of uptake can be for several reasons, including online safety and data security (as discussed previously). A teacher described one parent "who was quite against it" for those reasons and did not participate until he had undertaken extensive research, which in this case, allayed his concerns. A further consideration is with the digital divide (Crang et al., 2006). The digital divide refers to more than who has access to the internet (first level); it is also concerned with how the internet is utilised, with online participation, and the different digital skills used (second level); and the final level is focused on the disparities in "benefits and concrete outcomes" (third level) (Ragnedda et al., 2019, p. 795). Although staff indicated uptake to Seesaw by parents is relatively high at Korimako (80-90 percent), some parents were still identified as unable to participate due to lack of or restricted internet access. One participant observed, "access… can be very limited for some. Priorities [for data use] become very different when you're forced to have them". Even with a very small sample of parents, there were clear differences in the way they (visibly) utilised the Family app (see Table 1).

Mouse parent was cautious with data use and only accessed the app when she was at home and could use her internet connection. This mother also indicated that while she could access the Family app, her digital skills were emergent rather than proficient, saying, "I'm still learning how to [do things] — I've just learnt how to email back from

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my phone the other day". This parent stated she did not use the internet frequently, and it was not required in her job. As these examples from the analysis indicate, some aspects of the first and second levels of the digital divide may apply to this parent and may limit the outcomes gained. Parent responses also illustrate that while Mouse 'liked' 70 percent of posts about her child, she only responded to one percent of posts with a comment, which is a phenomenon also found elsewhere (Moorhouse & Beaumont, 2019). What does this suggest about this parent's engagement? Blau and Hameiri (2012) present passive and active online interactions as a possibility, describing "passive interactivity [as]… logging into the system" (p. 703).

Regarding Seesaw interactions, I propose 'liking' is not much beyond passive interactivity, whereas commenting demonstrates a more active interaction (as would sending messages). However, Goodall (2016) cautions equating visible (active) responses with interest as users may seek the information supplied but not choose to interact themselves (passive). In fact, all three parent participants talked extensively about the posts on Seesaw and what they learnt about their child, the learning taking place in the classroom, and the teacher. Two parents (Snake, Tiger) also gave examples of how the information gained was discussed and extended at home and indicated communication with the teacher about this. While this kind of use may be developed in other parents with greater clarity around purpose, it may also depend on how the teacher uses the space. For example, the teacher for Mouse's child very rarely commented on individual posts, restricting most interaction to 'likes'; as a user with low digital skills and other socio-cultural and economic factors that relate to levels of the digital divide (Ragnedda et al., 2019), this parent may be modelling their interactions (even subconsciously) on that of the teacher.

7. Discussion and conclusion

A spatial analysis of the digital space designed by Seesaw has demonstrated that while tensions and gaps must be considered, the space offers potential for enhancing parental engagement practices at an elementary/primary school level. The spatial approach draws attention to how such a space can be enacted for parental engagement and whether it can positively transform routines and blur the boundary between home and school or overcome constraints to practice. The adaptation (see Figure 2) of Harrison's (2018) framework allows us to assess this space and identify the tensions met by users in practice. Analysis was organised under the three main sections of the adapted framework: 1) Spatial Practices (ordinary routines); 2) Representations of Space (design); and 3) Representational Spaces (negotiated perceptions and enactments). A further section analysed the tensions, gaps, and contradictions identified within and across these sections. A discussion of the findings follows.

Some of the most salient forms of parental engagement do not require parents to be at the school physically (Hattie, 2009; Hong & Ho, 2005; Jeynes, 2018), and as explored by other researchers (e.g., Baxter & Toe, 2021; Goodall, 2016; Olmstead, 2013), technology has the potential to support these home-based aspects. The Korimako case, analysed using the adapted framework, illustrated how the Seesaw digital space is relational, a product of designers and coders, but also the users and material context (Thompson, 2014). The findings demonstrate how teachers and parents negotiate this space and the opportunities and tensions that surface through their enactments.

The *ordinary routines* of the framework are shown to be based on established ways of communicating that reproduce the familiar relationships and subject positions (such as parents as co-operative receivers and supporters) while in tension with sought-after educational partnerships and potentially more salient forms of parental engagement (Goodall & Montgomery, 2014; Jeynes, 2018). Analysis of the *designed transformations* within Seesaw revealed the potential for the digital space to extend communication for parental engagement in new and enriched ways. The space facilitated the sharing of information that was either previously only accessible to parents by physically coming into school (such as modelling of learning processes or everyday classroom practices) or was enhanced (direct to parent, real-time, language translation, greater volume, and multimodal). These aspects contribute to more timely and informed learning conversations between parent and child (Baxter & Toe, 2021; Lewin & Luckin, 2010). The findings also show that a key tension of the Seesaw design is the functionality of the Family app, which impedes the potential for communication to shift beyond the unidirectional teacher-parent flow.

Analysis of the *negotiated perceptions and enactments* illustrated some of the previously identified opportunities and tensions. Teachers and parents perceived the potential of the Seesaw space and were able to make sense of it in many ways that aligned with their expectations and practice (e.g., communication to support reporting, richer information on the learning process and student progress). There remained tensions on the purpose of Seesaw and, as a result, the content of posts and comments made. Predominantly, the findings showed that without the potential for sharing information parent-to-teacher, genuine dialogue was hindered along with the realisation of educational partnerships. This

presents a risk that the digital space offered by Seesaw will perpetuate and replicate existing roles and ways of being (Harrison, 2018) (e.g., parents as co-operative receivers) rather than support new relationships (e.g., parents as partners in learning).

Further research is now needed to explore how the global Covid-19 pandemic has, and continues to, influence virtual spaces and parental engagement. The pandemic has been the catalyst for an explosion of research examining distance education and digital technologies (Bonk, 2020), but there is still more to consider, particularly as it concerns parental engagement. What changes has the pandemic brought to home-school relations? Are the efforts made in response to the 'emergency' temporary, or will they be sustained beyond the lockdowns and isolation requirements? Breslin (2021) notes that returning to "parents' evenings in crowded halls or as a room-to-room dash along unknown corridors for rushed appointments can never hope to satisfy the spirit of genuine parental *engagement* that has emerged in some schools during lockdown" (p. 19, emphasis in original). Have the changes designed by Seesaw to adapt to the pandemic environment aided or hampered parental engagement via the app? Do the relationship bonds and understandings forged by parents and teachers under pandemic conditions continue when children are back in classrooms and parents resume their work/life routines? Initial research suggests at least an interest in building from those empathetic foundations (Breslin, 2021, p. 20).

In conclusion, I argue that Seesaw has the potential to be transformational. It has already started to transform the way in which written reporting to parents occurs at Korimako School and elsewhere (as indicated on the New Zealand Seesaw Teachers Facebook page). The potential for regular, real-time information on learning has demonstrated greater value to parents than the traditional written reports, and was found to supplement parent-teacher interviews. The digital space designed by Seesaw has created a new opportunity for schools to invite parents to engage with their child's learning, thus potentially connecting with parents who did not, or had been unable to, respond to other invitations. However, for Seesaw to fully realise its potential in facilitating a learning partnership between teachers and parents, to enhance children's learning, then the ability for parents to create posts and initiate communication needs to be designed into the Family app space, allowing reciprocal enhanced communication/information sharing. Additionally, by articulating a clear purpose that attends to the principles of parental engagement with children's learning (Goodall, 2016; Jeynes, 2018), and supporting teachers and parents with training and guidance appropriate to their context to enact that, the nascent advantages already seen in practice can be maximised without relying on further alterations in design. In this way, schools can realise an aim of not simply using digital space to inform parents through their communication, "but rather… support their effective engagement with the learning of their children" (Goodall, 2016, p. 126).

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