Children's Engagement with Their Learning Using E-portfolios

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Abstract

Narrative approaches to documentation and assessment in early childhood education (ECE) encourage children to be active contributors to their own learning journey. The growing emphasis on technology in society is changing assessment practices, with the introduction of e-portfolios into ECE, extending traditional documentation methods. Despite their growing popularity in New Zealand ECE settings, little research into their impact on children and their learning has been undertaken to date. This study examined children's engagement with their learning using e-portfolios through a national online survey and case studies of two ECE centres. This article presents findings from the study, including children's engagement with hard-copy and e-portfolios, connections between home and the centre, and teacher practice to inform how teachers may utilise e-portfolios to support children's learning.

Keywords: E-portfolios, early childhood education, assessment, children's learning, documenting learning

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The way we communicate and share information has shifted dramatically over the last few decades. As a result, children are experiencing a technologically-rich world, and rapidly developing competencies, cognitively, emotionally and socially, to engage with such technologies (Plowman, McPake, & Stephen, 2010). These technological influences are also apparent within early childhood education (ECE) services, particularly in assessment and documentation practices, and through the introduction and growing popularity of e-portfolios.

Assessment within New Zealand ECE contexts is both formative and non-prescriptive, reflecting individual children's learning 'pattern' or 'mat' (Ritchie & Buzzelli, 2012). The introduction of *Te Whāriki* in 1996 (Ministry of Education)[1] saw socio-cultural approaches to assessment emerge, including pedagogical documentation. Such documentation uses authentic strategies such as narrative, images and reflection to assess, further extend and support children's learning (Te One, 2002). Thus, pedagogical documentation is the approach used to collect and record evidence of children's engagement in learning that can be used to assess learning by teachers, children and families, and to re-visit, extend and provide for continuity of learning. As these two terms are intertwined in ECE, they are used interchangeably in this article.

Traditional paper-based narrative approaches to assessment and documentation in ECE empower children to be active contributors to their own learning and developmental journeys. There is, however, little research into children's engagement with e-portfolios in documenting and reflecting upon their learning. E-portfolios are becoming increasingly evident within New Zealand ECE, having been introduced as an enhancement to traditional hard-copy portfolios, allowing teachers to create learning stories, upload daily snapshots and communicate with parents. Whilst e-portfolios benefit parents' and teachers' engagement with children's learning (Goodman & Cherrington, 2015), there has been little exploration of children's engagement with their learning through this medium. The impetus for this study came from a concern that if traditional methods of documentation and assessment are replaced by e-portfolios in ECE, how are children able to contribute to the documentation of, and re-visit, their learning?

To date, understandings about the potential use and benefits of e-portfolios within ECE

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1) A revised version of Te Whāriki was released in April 2017.

settings have primarily relied upon empirical research from other educational settings that may not always be relevant (Goodman & Cherrington, 2015; Hooker, 2016). Benefits revealed in such studies include their instantaneous nature, accessibility, minimisation of costs and ease of communication with parents (Barrett, 2010; Wuetherick & Dickinson, 2015), factors relevant to ECE. Meade (2012) has argued that communication and participation by parents is critical to enhancing learning outcomes for children, reflecting the principles of *family and community* and *relationships* that underpin the New Zealand ECE curriculum, *Te Whāriki,* (Ministry of Education, 2017). E-portfolios may provide a mechanism to support such communication and participation given Woodward and Nanlohy's (2004) finding that, with the increase of technology in teachers' personal and professional lives, e-portfolios complemented their current practices and developed relationships with students and their families.

A significant challenge in implementing e-portfolios into ECE is the cost for settings (Goodman & Cherrington, 2015), particularly in times of reduced Government funding to ECE centres (NZEI Te Riu Roa, 2016). Where services elect to use both online and hard-copy versions of children's portfolios, further financial and time constraints have been identified (Goodman & Cherrington, 2015). Barrett (2010) has questioned whether e-portfolios over-emphasise showcasing learning rather than the learner process, suggesting teachers need support to develop strategies to enable student reflection and self-assessment.

Assessment in ECE

Within New Zealand, the shift to pedagogical documentation altered the way teachers, families and children communicated and assessed children's learning (Te One, 2002). *Te Whāriki* positions children as learners within their own socio-cultural context (Ministry of Education, 2017) with assessment approaches conceived as being *for* learning, rather than just *of* learning. Thus, assessment practices help teachers and families to support learning that is relevant to, and reflective of each child's individual strengths and interests (Hooker, 2016; Ritchie & Buzzelli, 2012). Learning stories invite collaboration between children, teachers and wider family members to support and reflect upon children's learning, thus ensuring that learning is meaningful and relevant. Children's participation, therefore, is

critical to developing strong learner-centred models of assessment (Hooker, 2016; Meade, 2012). Variations in how children engage and contribute to their hard-copy portfolios are evident in New Zealand research. In some settings hard-copy portfolios may go unread by parents or children (Goodman & Cherrington, 2015). In other settings, however, children engage frequently with their hard-copy portfolios, taking them home and showing their families as well as adding stories themselves to contribute to their learning (Steele, 2007).

Children's Engagement with Pedagogical Documentation

Carr's (2011) research identified three factors that are imperative in assisting children to engage with their own learning - ownership, partnership and accessibility. Ownership is developed when children are aware of the documentation process and of the different roles they can enact to contribute to their learning - they have an active role, greater understanding of their learning and control over what is shared with their family. Within ECE settings, such ownership is influenced by the significant power teachers hold over children in learning, documentation and decision-making (Carr, 2011). Both Carr (2011) and Hooker (2016) state it is important for ECE teachers to listen to children, ask open-ended questions in order to understand what is important learning for them, and to co-author documentation with children.

Partnership is developed when centres, children and families partner with each other in order to establish learner-centred outcomes for children (Meade, 2012). Studies show that developing strong, reciprocal relationships with families enabled teachers to develop greater understanding of families' values, in turn transforming how they understood and supported children's learning and the quality of their documentation (Jones, 2006; Meade, 2012). Regardless of the quality of partnerships between parents and teachers, children's portfolios are less relevant to children if they do not have access. Carr's (2011) study found that children were more likely to engage with their learning in a hard-copy portfolio when these were well-labelled for easy identification, readily accessible and near a comfortable reading area to encourage children and parents to take time reading. Similarly, Steele (2007) found that the accessibility of portfolios significantly influenced young children's contribution to their learning. Her study investigated the availability of hard-copy portfolios

for children and parents and initially discovered children were not contributing to their portfolio because they were not aware that they could. After adapting teacher practice and making portfolios more accessible a noticeable change was observed - children re-visited their portfolios daily, developed greater critical self-reflection and showed respect when reading and storing their books. Te One (2000) suggests that accessibility also encompasses intellectual accessibility: documentation added to portfolios had to be comprehensible to both adults and children, balancing words and photos to encourage reflection.

Little research attention has been paid to young children's engagement with e-portfolios (Goodman & Cherrington, 2015; Higgins, 2015; Hooker, 2016). A study by Goodman (2013, as cited in Goodman & Cherrington, 2015) found parents and teachers were more engaged with children's learning and teachers had improved communication with whānau[2]. Whilst the study found that whilst children were viewing their e-portfolios alongside their parents at home, as well as sharing these with their wider family, it did not explicitly consider children's engagement with their learning (Goodman & Cherrington, 2015). Hooker's (2016) doctoral research in one New Zealand setting investigated whether teachers, parents and children engaged differently with e-portfolios compared with their paper-based portfolio. Whilst her results revealed great benefit for teachers, parents and whānau using e-portfolios, she also questioned how children are engaging and contributing to their learning with e-portfolios and how this might affect their learning over time (Hooker, 2016). Thus, this article aims to report on findings of young children's engagement with their learning using e-portfolios, and how teachers could support parents and children to access children's learning through their e-portfolio.

Methodology

The research was undertaken as part of a Master of Education thesis at Victoria University of Wellington undertaken by the first author. Ethical approval for the project was given by the Victoria University of Wellington Human Ethics Committee (Application # 21198).

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2) Whānau is the Māori word for extended family

A mixed methods approach was chosen for this study due to its ability to draw on the strengths of both quantitative and qualitative research, ensuring different levels of enquiry to be addressed to answer the research question (Creswell, 2008). The use of multiple perspectives, as used in this study, strengthens educational research as it enables a deeper understanding of participants' perspectives (Creswell, 2008). Within this study, the methods used enabled a wealth of complementary data to be gathered, ensuring data triangulation (Johnson & Christensen, 2012).

An interpretive paradigm that sought to record particular phenomena from the perspectives of the participants involved (Joniak, 2002) underpinned this study. Data collection drew on the experiences of teachers, family members and children, in understanding children's engagement with their learning through e-portfolios.

The research question used for the study was: *In what ways are children engaging with their learning through their e-portfolio?*

Sub-questions arising from this were:

• What access is provided for children to view their online portfolio?

• In what ways are children involved in the documentation process?

• How are children encouraged to contribute to their e-portfolio?

• What connections are being made by children between the home and their centre through using their e-portfolio?

• In what ways are parents re-visiting the child's portfolio with their child at home?

The study, comprising a three-phase data collection process, gathered perspectives from teachers, parents and children. New Zealand ECE caters for children from birth to five years with 96% of children attending ECE (Education Counts, 2015). The main service types are teacher-led (kindergarten, education and care, home-based), parent-led (Playcentre) and whānau-led (Te Kohanga Reo). Phase one involved a national online survey sent to all education and care and kindergarten settings (N=2315) in New Zealand inviting those centres who used an e-portfolio provider to participate. Several commercial e-portfolios are available to New Zealand ECE services by companies who provide the e-portfolio platform, together with logistical and professional support to teachers. In this

study, no differentiation was made between these different e-portfolio providers.

The national survey sought to gather data on how e-portfolios were used with children in ECE settings. Responses from the national survey assisted in refining the data collection protocol and instruments for the case study survey and subsequent site visits. The national survey comprised of six fixed-response demographic questions, followed by nine fixed-response questions investigating children's experiences with e-portfolios in their service. Two qualitative questions asked for further information on the differences between hard-copy and e-portfolio use as well as challenges respondents may have faced using e-portfolios. In total, 876 centres opened the email with the survey invitation and 115 began the survey questions. Respondents did not always complete all the survey questions; data presented below represents actual response rates, and do not include non-respondents to questions. Informed consent to participate was gained from all survey respondents and from the management, teachers, parents and children in the case study centres.

From this national survey, two centres were randomly chosen from those eligible, and who indicated interest, to participate in the case studies (phase two and three). One case study centre, Grendale Education and Care, was located in a main city, had 77 children on the roll and 11 teaching staff whilst the other, Dibley Kindergarten, was located in a smaller town, had 40 families and five teaching staff. Both services had been using e-portfolios for at least a year and all children had their own e-portfolio (see Table 1). Prior to the site visit, an online case study survey was distributed to all teachers and parents inviting them to share their personal experiences and views with e-portfolios. This case study survey sought to gather more specific information about how children and families were using e-portfolios together with their use within the ECE setting. Data from these surveys are woven into the case study site visit data reported below. Each site visit occurred over four days and involved interviews with parents, teachers and children alongside document analysis of children's online and hard-copy portfolios and observations of children and teachers' use of e-portfolios. These observations were written up as vignettes.

Table 1. *Case Study Settings*

	Dibley Kindergarten	Grendale Education and Care
Location of ECE setting **Opening hours**	Small New Zealand town 8.30am-2.30pm; children attend up to five days a week	Large New Zealand city 7.30am-5.30pm; children attend minimum 6 hours/day
Number of children on roll (age of children)	43 children	77 children
Number of teaching staff	Five staff	11 teachers
Time using e-portfolios	>12 months	>18 months
Interviews	Teachers: focus group interview with all teachers after session. Parents: 14 interviewed; mix of focus group (up to 15 minutes) and individual interviews (5-10 minutes). Children: 20 shared their e-portfolio during site-visit. Questions used to prompt discussion with notes taken about what children chose to share.	Teachers: Individual interviews with 8 teachers during the day (10-15minutes). Parents: 8 individual interview (5-10 minutes) Children: 10 shared their hard-copy portfolio during site-visit. Questions asked about both hard-copy and e-portfolio with notes taken.
Observations	Observations over a four-day period during free play time; focused on children's engagement with and conversations about their e-portfolio; connections between children's e-portfolio and play; engagement by teachers with children's e-portfolios.	Observations over a four-day period during free play time; focused on children's engagement with their hard-copy portfolio and teacher engagement with the e-portfolio platform. NB: E-portfolios not used by children within the setting session.
Document Analysis	E-portfolios viewed alongside children and independently to see how used by teachers, parents and children. Other relevant documentation in the ECE environment was recorded and analysed.	E-portfolios were viewed in the office, as not available to children. Children's hard copy portfolios were reviewed. Other relevant documentation in the ECE environment was recorded and analysed.

Whilst the national survey data assisted in informing the case study protocol, full data analysis commenced after the completion of case study data collection. Descriptive statistics were used for the quantitative data which enabled findings to be presented in tables. Qualitative data were transcribed, coded into themes and then examined using thematic analysis. Findings presented below draw predominately from the national online survey supported by data from the two case studies.

Results

National survey respondents were widespread across New Zealand. Eighty settings were licensed for between 30-60 children (70%) with 10 services licensed for under 30 children (9%) and 25 services licensed for over 60 children (22%). Two main e-portfolio providers were used and 56% of settings indicated that all children in their service had their own portfolio. Almost half the respondents indicated they had used e-portfolios for less than one year (49%) with 36% using e-portfolios between one-two years and 15% for longer than two years.

Access provided for Children to view their E-portfolio

Several of the national survey questions examined the access provided for children to engage with their e-portfolio. Table 2 presents data on opportunities for children to access their e-portfolio within the centre. Results indicate that the majority of settings (82%) provided children with electronic access to their portfolio whilst almost two-thirds (64%) provided both online and hardcopy portfolios."

National survey respondents were asked how frequently children accessed their e-portfolio (see Table 3). Thirty-four percent indicated children were engaging with their e-portfolio at least once a week; whereas almost half (45%) observed less regular engagement. Nineteen centres (21%) shared that children never re-visited their portfolio. When asked how children preferred to re-visit their e-portfolio, respondents noted that they were more likely to do so alongside a teacher (55%) or a teacher and their peers (46%) than with their peers (28%) or independently (21%).

Table 2. *Opportunities Provided for Children to Access their E-portfolio within the Centre*

Access	Number	%
Use of centre computer	24	27%
Use of centre iPad or other electronic device	40	45%
Use of iPhone or Android phone	9	10%
Keep a hard-copy as well as an online copy	57	64%
Children can access with a staff member on the staff computer	45	52%
No access available	9	10%
Other (please specify)	**8**	**9%**

Table 3. *Frequency Children Revisit their E-portfolio*

Frequency	**Number**	*%*
Everyday	4	5%
3 – 4 times a week	9	10%
1 – 2 times a week	17	19%
Once a fortnight	8	9%
Less than once a fortnight	32	36%
Never	19	21%
Total	**89**	**100%**

The case studies enabled issues explored in the online survey to be investigated in greater depth. Teachers from both case study sites commented on their enjoyment in using ICT, particularly e-portfolios, finding the transition from hard-copies to online straightforward. The Grendale Education and Care teachers viewed e-portfolios as a tool for communicating with parents: children did not have access to or, for some, knowledge of their e-portfolio in the centre, although videos posted to their e-portfolios were shared on the centre's television. Teachers maintained the children's hard-copy portfolios which were accessible for the children throughout the day. Children engaged daily with these hard-copy portfolios, and had a strong sense of ownership over the content within them, contributing their ideas and views.

At Dibley Kindergarten teachers provided tablets in the reading corner for children to access their e-portfolio freely. Children regularly did so throughout the session and demonstrated ownership of their portfolios, sharing them with friends and noticing when new stories or comments had been uploaded. They were observed actively contributing to

documentation, asking to upload photos or write a message to their parents. Regular connections between their e-portfolio and their play were made by children with more than half of those spoken to during the site visit re-engaging in an activity after reading about it in their e-portfolio.

Ways that Children are involved in Documenting and Contributing to their E-portfolio

Children's engagement goes beyond just re-visiting their e-portfolio, thus national survey respondents were asked how children contributed to their e-portfolio. Children were most likely to take photos to add to their stories (67%), dictate or add their voice (63%), or contribute comments or responses to their e-portfolio (58%). Children were least likely to assist in writing up stories on the computer and iPad (29%). Centres were also asked to describe connections they had observed children making in their conversations and play that related to their e-portfolio engagement and learning (see Table 4).

Table 4. *Children's Connections between Online Engagement and their Play*

Connections being made by children	Number	%
Frequently	11	14%
Occasionally	33	42%
We have not noticed this	34	44%
Total	**78**	**100%**

Frequent connections were observed by 14% of respondents, including children planning, revisiting interests and retelling stories. Respondents describing occasional connections (42%) reported examples of children planning for new activities, reflecting upon learning or talking with others about their e-portfolio content. Forty-four percent of respondents had not noticed connections between children's play and their online engagement, primarily because children did not have access or preferred to engage with their hard copy.

In both case studies, teacher practice was influential in increasing children's engagement with their learning through their e-portfolios. Dibley Kindergarten teachers reported increasingly encouraging children to contribute to their e-portfolios, having noticed benefits to children's learning when they included them in the process.

Case study teachers at Dibley Kindergarten expressed concern about how often children talked about "me, me, me" when re-visiting their e-portfolio, rather than focusing on the learning or activity portrayed. Whilst children were very interested in viewing their e-portfolio, they were less interested in undertaking a Google search or looking at a website to discover more information on a topic. These teachers questioned whether it was the prevalence of images and videos of themselves and their peers that appealed to children rather than interest in re-visiting the actual learning or activities portrayed, perhaps influenced by broader social media activity. Thus, these teachers wanted to ensure that children's learning and development remained at the forefront and were looking to strengthen how children's learning was presented in their stories.

In order to understand any potential difference between children's engagement with their learning using e-portfolios or more traditional hard-copy portfolios, the national survey asked those centres that used both whether, and how, children engaged differently with the two approaches. Several themes emerged from their responses.

Fifty-three percent of respondents indicated that children preferred their hard-copy or only had access to their hard-copy portfolio:

> Children have taken more ownership with the hard-copy as it is easy for them to access on their own and they can quickly add their own work using basic tools.

Thirty-two percent of respondents indicated children had either no access or were not able to engage with their e-portfolio whilst in the centre:

> As there are at present no computers in the room, they don't have access to the e-portfolios at the centre.

Twenty-two percent noted children only accessed their e-portfolio with a teacher or on a large screen as a group:

> When they are online they prefer to look for games rather than look or listen to their stories. There is a lot more teacher direction with online rather than hard-copy.

Fourteen percent reported how much children enjoyed and became excited by engagement with their e-portfolio:

Children are more motivated to engage with the technology and most love to watch and share videos of them that are uploaded onto [e-portfolio]. The learning becomes much more much exciting and visible to them in this way.

Similar numbers of respondents commented children were shown their e-portfolio at home but not within the centre (11%) or that e-portfolios were purely for parent and whānau engagement whilst hard-copy portfolios were for children (10%):

E-portfolios are used with the audience of parents and whānau in mind...hard-copies are slightly different with the audience being for children and their peers so there are bigger photo and shorter stories.

When asked the extent respondents felt e-portfolios influenced children's engagement with their learning compared with hard-copy portfolios, wide-ranging responses were evident (see Table 5). The majority of respondents felt there was *little* influence (N=27; 35%) or no influence (N=19; 25%). Whilst 19 (25%) services felt that there was *quite a lot* of influence on children's learning, providing examples such as shared learning with family, children's contribution of their own perspectives and engagement with videos, a smaller proportion (N=12; 16%) felt that children's engagement with their learning had been influenced *a great deal*, giving examples such as children having a greater role in documentation, enjoying their e-portfolios and increased discussion between teachers and children.

Table5. *Extent That E-portfolios Influence Children's Engagement with their Learning Compared with Hard-copy Portfolios*

Extent of engagement	Number	%
A great deal	12	16%
Quite a lot	19	25%
A little	27	35%
Not at all	19	24%
Total	**77**	**100%**

Connections between Home and Centre through E-portfolio Use

Children's engagement with their learning through their e-portfolio did not occur purely within the centre setting. Respondents were asked to describe connections made between the child's home and their centre setting by teachers, by parents and by children (see Table 6). Fifty-five percent reported children making connections between their home and centre, including talking about their stories, sharing stories with whānau, adding photos or their own voice, and re-visiting home experiences in the centre.

Table6. *Connections made between Home and Centre by Parents, Teachers and Children*

Connections made	Yes	No	Not Applicable	Total Responses
By children	35	19	10	64
	(55%)	(30%)	(15%)	
By parents	71	2	1	74
	(96%)	(3%)	(1%)	
By teachers	**58**	**5**	**2**	**65**
	(89%)	**(8%)**	**(3%)**	

Table7. *Ways Parents Revisit E-portfolios at Home with Children*

Ways parents revisiting	Number	%
Reading the stories aloud with their child at home	44	57%
Letting the child review their portfolio independently at home	22	29%
Using the stories online to make connections to learning interests at home	50	65%
Contributing new stories from home with their child	54	70%
Sharing the e-portfolios with their child and wider family members	56	73%
Not sure how parents revisit the portfolio with their children	22	29%
Other (please explain)	**4**	**5%**

Respondents were asked how parents re-visited their e-portfolios with their children at home (see Table 7). Parents were most likely to share learning stories with their child and wider family (73%), contribute new stories from home (70%), use the online stories to connect with children's learning interests at home (65%) or read stories aloud with their

child (57%).

Following the introduction of e-portfolios, parents from both case study settings felt more connected to their child's learning, with many more confident in sharing stories or comments from home. At Dibley Kindergarten, whilst some parents interviewed commented that they missed being able to sit down and flick through their child's hard-copy portfolio alongside their child, all preferred the increased accessibility of e-portfolios. In contrast, each of the eight families interviewed at Grendale valued being able to take their child's hard-copy portfolio home to re-visit with their child. This sentiment was echoed in the survey of Grendale parents who, whilst valuing the e-portfolio, preferred the hard-copy portfolio when sharing with their children. Both parents and teachers felt that without the hard-copy portfolio, children would be distanced from re-visiting their learning, believing that e-portfolios and hard-copy portfolios served different purposes.

Across both case study centres, teachers identified the need for greater support and training in implementing e-portfolios and indicated a desire to extend and challenge their practice.

Discussion

The variance in responses and observational data in this study indicates the need for more support and professional attention to ensure that e-portfolios, where used in ECE, effectively support children's learning.

Children's Engagement with E-portfolios

Both the case studies and online national survey responses indicated varied engagement by children with their e-portfolios. Whilst 33% of the survey respondents indicated children were engaging with their e-portfolio at least once or twice a week, more than half identified children never engaged or engaged less than once a fortnight. Similar variances were also evident in the two case studies: in one setting children re-visited their e-portfolio daily using tablets, whereas the second centre provided children with their hard-copy portfolio

rather than with e-portfolio access. National survey data showed a variety of ways that teachers and parents provided children with access to their e-portfolios: the most common being computers and iPads/tablets, both at home and in the centre. These results indicate that e-portfolios are being used quite differently across ECE settings, highlighting the need for further research in order to understand what professional learning and support teachers require to effectively utilise e-portfolios.

National survey responses showed that children preferred to re-visit their e-portfolio alongside a teacher, parent or their peers, rather than independently. Case-study observational and interview data revealed episodes of greater interest and engagement by children with their e-portfolio as a result of joint-attention by a teacher, parent or peer. Carr's (2011) research on children's engagement with their learning with hard-copy portfolios showed that involvement from teachers and peers resulted in greater engagement and ownership of learning for children. Similarly, in this study, greater levels of engagement and contribution were observed in the case study setting where e-portfolios were a focus for teachers. Their enjoyment of technology was evident in their practice, resulting in more extended engagement by children, increased numbers of stories uploaded and more conversations and connections made.

For many children engagement with their e-portfolio at home was the only access they had to their online documentation, as opportunities were not provided in their centre. Most parents who participated in the case study survey regularly looked at their child's e-portfolio at home, although several commented that they often lacked time to do so with their child. Parent interviews also showed diverse engagement: from parents actively reading and contributing to the e-portfolio with their children, to reading the e-portfolio to understand their child's learning without their child's involvement, or not viewing their child's e-portfolio at all. Results from the national survey showed that some teachers believed it was parents' role to show their child the e-portfolio and therefore did not provide access, whilst others made sure that children could access them at the centre if they knew children did not see them at home. Teachers clearly have an important role in supporting and encouraging parents to engage with their child's e-portfolio through uploading stories or comments, or discussing what they have read, to encourage their active contribution to centre planning and practices (Goodman & Cherrington, 2015).

Children Documenting their Learning

Garthwait and Verrill (2003) argue that documenting learning with children empowers them. National survey data regarding children's contributions to their own e-portfolio showed that children most commonly took photos for stories and dictated learning stories and project documentation. Children were less likely to write stories online alongside teachers, add stories from home, or add artwork; furthermore, a small number of respondents indicated that children did not contribute at all. One of the benefits of e-portfolios is that they allow teachers and children to write stories and upload images easily and remotely. These findings suggest missed opportunities for teachers to be utilising technology and including children collaboratively in their documentation practices in the centre at the time of children's learning, rather than writing stories independently after the episode.

The metaphor of children weaving their own learning journey is foundational to *Te Whāriki* (Ministry of Education, 2017). The flexible nature of e-portfolios allows teachers to support this through encouraging children's contribution to documenting their learning. Carr's (2011) study noted the importance of teachers co-authoring documentation with children, particularly given the power teachers have over what is recorded. Across both the national survey and case studies, teachers indicated that they wanted to strengthen how they collaborated with children in documenting learning.

Children's Engagement with their Learning through E-portfolios

National survey results of children's engagement with their learning through e-portfolios were diverse: 40% of respondents reported children engaging *quite a lot* to *a great deal* with their e-portfolios, noting that children had greater interest in their learning, engaged in increased discussion and sharing of their own perspectives and showed more excitement and enjoyment. Sixty percent of respondents, however, felt there has been little or no change in children's engagement with their learning, commenting that e-portfolios were still new to their centre or that children did not have access to their e-portfolio. Respondents indicated that where children did not have access they had little understanding of where

their learning stories came from or how they could actively re-visit or contribute to documenting their learning.

Observations of case study children who were actively involved with their e-portfolio at home or in the centre revealed strong engagement with their learning, including developing self-assessment skills and reflecting on their development and achievements. Whilst teacher responses, across the national and case study surveys, acknowledged the influence they felt e-portfolios have had on children's engagement many indicated teachers needed support to use e-portfolios more effectively to strengthen children's connections to their learning.

Teachers were concerned about some children's focus on themselves when re-visiting their e-portfolio rather than identifying and discussing their learning, activities or friendships. Whilst interest in images of oneself was also evident with hard-copy portfolios, teachers in both case studies felt the nature of social media could be negatively influencing children's ability to look beyond pictures of themselves to reflect upon their learning reported in a story. Woodward and Nanlohy (2004) argue a similar point, questioning whether it is the technological appeal of e-portfolios that influences their desirability. Teachers in one case study were working to transform their documentation practices by strengthening their focus on learning and achievement in their learning stories rather than including only images and descriptive statements for the children.

Accessibility and Ownership of E-portfolios

Accessibility and ownership are two of three important aspects empowering children to engage with their learning (Carr, 2011). Having portfolios accessible for children encourages them to read, reflect upon and contribute to them in meaningful ways; this is turn develops ownership over their learning. When introducing e-portfolios some centres chose to maintain both hard-copy portfolio and e-portfolios whilst others have moved to placing all documentation online. The national survey data reported above revealed children had varied access to their e-portfolio, whether in their centre or at home. In one case study, teachers saw e-portfolios as enabling engagement by parents and whānau whilst hard-copy portfolios were for children to engage with and share. Whilst approaches such as this suggest centres are considering the needs of their community, more broadly defining

the target audience of e-portfolios before implementation would enable practices to be adapted to include both children and families in documentation. Findings from this study suggest teachers could encourage children's active participation in dictating, writing and sharing learning stories, including supporting parents to do this at home, in order to strengthen children's engagement with their e-portfolio and thus their learning.

Teacher Practice around E-portfolios

Findings around teacher practice echoed those of Goodman's earlier study (Goodman & Cherrington, 2015) where data revealed that using e-portfolios resulted in parents and teachers being more engaged with children's learning. In that study teachers commented that e-portfolios assisted them to collaborate more with children, helped set goals, re-visit learning effectively and support children's greater learning interests. Teachers in both studies valued external support and training to effectively use e-portfolios in their setting.

The role of teachers and families is pivotal to the success of e-portfolios in educational settings (Garthwait & Verrill, 2003) in facilitating children's engagement with their own learning. The instantaneous nature of today's society means that information is readily shared and easily accessed, and whilst e-portfolios support this, teachers felt parents needed greater understanding of the work involved in writing learning stories. For teachers this may mean careful induction of parents and whānau to e-portfolios, sharing the process of developing a learning story and being transparent about the workload involved in keeping portfolios up-to-date.

Data from both the national survey and case studies highlighted the idiosyncratic approaches taken by management and teachers to decision-making around e-portfolios. E-portfolios were adopted in some centres without good support for implementation and where decisions were made around printing, accessibility and online feedback without wider discussion of relevant issues. For example, centres who maintained both hard-copy portfolios and e-portfolios would print online learning stories and add them to the hard-copy portfolio. Teachers in the case study centre that used both types of portfolios commented that they were selective about which stories were printed for children's hard-copy portfolios, based on the level of engagement by a child's parents with their e-portfolio

and the type of story. Whilst the financial and time costs are significant factors in maintaining both types of portfolio, children should not be disadvantaged by such practices, particularly given that young children can be easily, albeit unintentionally, removed from the information about them that goes online (Lorenzo & Ittelson, 2005). Consideration of issues such as printing and maintaining both online and hard-copy portfolios require attention before the implementation of e-portfolios within ECE settings.

Conclusion

E-portfolios are a relatively new tool for assessment and documentation in ECE, which are still being trialled and tested. Research such as this study can build understanding of how teachers, parents and children use e-portfolios and how to strengthen their use. The findings highlight how important it is for centres to consider teacher practices, including appropriate professional development, to support effective engagement with e-portfolios by children and their families, prior to their introduction. Security, suitability for the centre community, practicality and accessibility of training material are important considerations to address before implementing e-portfolios into a centre (Ministry of Education, 2011). Furthermore, teachers' professional learning may be necessary to support both their confidence in using e-portfolios and their ability to effectively document learning, including involving children.

A key question remains: if documentation of children's learning is only available online, how do teachers ensure that young children are able to re-visit, reflect on and self-assess their learning? This concern was at the forefront of this study; findings revealed significant variation in how e-portfolios are being used in New Zealand ECE settings, with many settings not harnessing their potential for young children. Children are at the forefront of teacher practice and it was concerning to see how easily e-portfolios could distance children from documentation of their learning. However, this study also demonstrated that with supported teacher practice, principled decision-making and collaboration with children, e-portfolios can be successfully implemented in ECE to benefit teachers, parents and children.

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