Computer use by preschool children
Rethinking practice as digital natives come to preschool

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THIS PAPER REPORTS ON the outcomes of a survey implemented in a large regional community of Australia. The survey was completed by parents of children aged four–five years and attending local early childhood centres. The survey identified the types of access and use of computers by preschool children. It was found that the children of the respondents had significant access to computers in the home (85%) and were skilled in many facets of computer use. Computers were used for a range of activities, some educational and others recreational. Gender differences in computer use were also noted. The study highlights the changing clientele of early childhood settings and the implications for practice in a field where computer technology is often seen as the antithesis of good practice.

THE WORLD OF MOST WESTERN children has undergone significant changes in the past few decades, brought about significantly by the uptake of computers. Yet early childhood philosophy has been one where particular notions have remained relatively consistent throughout this period. Indeed, some educators see the use of technology as the antithesis of good practice in these settings. This paper documents the use of computers by young children and the skills and dispositions they bring to early childhood settings. It is proposed that the outcomes of this study indicate that young children have extensive exposure to computers in their out-of-school contexts and that early childhood settings need to recognise the changes within their clientele; their concomitant dispositions to learning and activity; and the implications these have for the provision of quality learning environments that enhance the learning for many children while seeking to address the potential digital divide for those from digitally poor families.

We locate this paper with the literature that acknowledges the impact of technology on young people who have grown up in social conditions where digital technology has been an integral part of their lives. We contend that the digital media children are exposed to may offer new potential for both children and the pedagogy in early childhood settings. Depending on the theoretical perspective one adopts, there is a well-established language of description for this cohort of people. They may be known as ‘digital natives’ (Prensky, 2001, 2005), ‘Generation Y’ (Chapp, 2003; Zabel, 1999) or ‘millennials’ ( Howe & Strauss, 2000; Zemke, 2001). Collectively, this literature recognises the distinct and defining characteristics of these young people as being quite different from previous generations. While this literature has tended to focus on older children and young adults, we sought to explore the ways preschool children may be engaging with digital media in the home and how this may impact on early childhood pedagogy. We contend that young children coming into early childhood settings may be different from other generations because of the social and technological conditions within which they are developing. At the same time, we consider the professional development of teachers with regard to the use of technologies in early childhood settings. While there is an international recognition of the potential of computer technology to create new learnings and environments, this has not been realised (Cuban, 2003). This is exacerbated in the context of early childhood, where digital technologies are seen to be oppositional to the ideologies that underpin what is seen as quality teaching in the learning settings.

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We pose the question that if young children are coming to early childhood contexts with a repertoire of digital skills and dispositions, what are the implications for the provision of relevant, quality educational experiences for the children attending these centres? This is particularly pertinent when educators espouse a 'child-centred' approach to their teaching. "Positioning the computer as separate from children's development and learning within the early childhood educational context is arguably akin to denying the role it plays in their sociocultural experiences outside the educational setting," (Marsh, 2002, p. 133, cited in Edwards, 2005). Furthermore, it may be compounded by the potential digital divide, where students have different experiences of digital technologies. There is a responsibility for early childhood educators to consider the impact of these differences and seek to redress them before the gap widens.

Computers, access and young children: The emergence of the digital native into preschool settings

Prensky (2001) has been a notable writer on the phenomenon of the digital native. He argued that this generation, having grown up immersed in technology, has begun to think differently from other generations (Prensky, 2005). While his work has been with older members of this generation, the point he makes in relation to the ways digital technologies shape the identities of young adults is equally pertinent to young children. This young generation has been immersed in technology since their emergence into that world. Their homes have computer technology in all facets of gadgetry—the remote control for the television, the programmable microwave, the remote and mobile telephone, computers, digital games (such as Xbox, as well as those on the computer). These offer significantly different ways of playing from what had been possible in non-digital worlds (Zevenbergen, 2007).

Prensky (2005) identifies a number of defining characteristics of digital natives. The extent to which these can be applied to children in the preschool years is not well known. Prensky argues that digital natives are more connected than other generations through technologies such as mobile phones, email and chat lines. Communication is a much more connected and global experience for this generation than has been possible in the past. This generation has been exposed to an economy in ways markedly different from their predecessors. They have been targeted by marketers to a much greater extent than any other generation. One only has to consider the music industry and the 'pop groups' that have developed to cater for this generation. Also, purchasing processes have changed radically through avenues such as eBay, Amazon or even local groceries being purchased via the web. Similarly, bills can be paid through BPay or over the phone. Cash transactions are minimal, with most payments being made through swipe cards.

The immediacy of these technologies has created a phenomenon of instant feedback. Whether playing games, wanting to purchase items or seeking to contact a person, most of the experiences of young children result in very quick feedback. Whether turning on the computer, cooking food in the microwave or changing channels on the TV, the delay from pushing the button to receiving a response is minimal. This generation has grown up in times where the potential for instant feedback (and gratification) is nearly always part of their interactions. The speed in response time also creates new learning environments in terms of information processing. The fast speed from action (click of mouse) to effect (the result of that click) means that young children process information quickly.

The range of resources available to them has created new dispositions among young children. The potential for multitasking has been a phenomenon of the digital native. Working on many tools simultaneously is a characteristic that defines this generation. While we could not find substantive research on this aspect of digital natives' behaviour, many parents and teachers comment on how older children use multiple resources simultaneously—the mobile phone, the Xbox, music, television—and interact with peers. Clearly, a research agenda needs to be developed around the impact of these social conditions on learning and the potential for learning. However, we would suggest that observational data indicates that young people are prone to multitask in ways that were not possible for their parents. When this multitasking tendency begins to appear could not be identified in the research literature, but we would suggest that its emergence could begin in the early years, particularly with those children who grow up in technology-rich homes.

The literature has shown that older members of this generation have developed considerably different dispositions from those possible among their predecessors: this being a consequence of digital technologies; in particular, computers. What is less well-known is how these changes are affecting the lives of preschool children. Furthermore, depending on the impact of information computer technologies (ICTs) in the lives and experiences of young children in their out-of-school contexts, early childhood education may need to seriously consider the changing dispositions of the children it works with.
Computers and early childhood pedagogy

The early childhood sector has been heavily influenced by particular views of child development and how children learn. Such views are often based on developmental psychology and seek to develop practices that are developmentally appropriate (Hirsh, 2004). More recently, emergent approaches such as Reggio have influenced practice but are more focused on curriculum organisation. Within the Reggio approach, there is potential for the incorporation of computer technology (Hong & Trepanier-Street, 2004; Wurm, 2005).

The dominance of developmental approaches has resulted in relatively stable models of practice within the sector. However, when considering the potential effect of technology (particularly computers) on young children, this may need to be considered within the development of appropriate models of learning and pedagogy (Rivera, Galarza, Entz & Tharp, 2002).

Technologies have been embraced by early childhood teachers as a form of documentation but less so for use by the children. Haugland (2000) has noted that early childhood educators should be cautious about when children start using computers. Once children use computers, the activities that are chosen should be developmentally appropriate. It has been consistently documented that 'the use of appropriate, open-ended software serves to support children's learning and contributes to their developing understanding of key mathematical concepts' (Yelland, 1999).

In this section we discuss the research that has explored the power of computers to change the ways of learning among young children. It is our intention to highlight the potential of this tool in the sector. At the same time, we draw on other literature that highlights the failure of the sector to embrace these technologies.

Within the Australian context, there is generally poor uptake of computers in early childhood settings (Downes, Arthur & Beecher, 2001) and there are considerable obstacles in the way of teachers using such technology in these settings (O’Rourke & Harrison, 2004). This is not the case in some other countries. For example, it was reported that 66 per cent of Finnish settings regularly use ICTs as part of their programs (Kankamanta & Kangassalo, 2003); while in Hong Kong, Leung (2003) reported that parents expect their children to use ICTs in their early childhood settings. Clearly there is a rapid increase in computer implementation in this sector. Downes, Arthur and Beecher (2001) argued that the lack of computers in many early childhood settings is partly because of a resistance within the field and wider community with the tools regarded as 'neither appropriate or important' (p. 133) in these settings. The views held by early childhood educators with regard to ICT usage are linked to their views of 'appropriate childhood' (Sheridan & Pramlin-Samuelsson, 2003, p. 277). A large study among Turkish early childhood educators indicated that the teachers thought computers had a negative impact on social development (Bayhan, Olgun & Yelland, 2002). Seeking to identify quality practice in early childhood settings, Creasey, Jarvis and Berk (1999) reported that concrete activities were valued as being synonymous with quality practices. Thus the digital environment, not being concrete, is less valued.

Another reason for the poor uptake of computers is the shortage of financial resources. Downes et al. (2001) argued that while the lack of funds to support the purchase of computers is part of the problem, equally problematic is resourcing the professional development of early childhood teachers. The lack of access to financial resources was reiterated by the Finnish teachers cited earlier.

Judge, Puckett and Cebuk (2004) have reported that it is increasingly important for early childhood educators to introduce and use computers in their settings, particularly for those children who do not have access in the home. Providing learning opportunities at preschool means that these children are better prepared for their school experiences. Offering access to computers in the early childhood setting helps to reduce the digital divide that occurs at school when those who have had access in the home are better prepared for school activities.

There is considerable literature that documents the potential of ICTs to create innovative, engaging and substantive learning opportunities for young children. For example, Pastor and Kerns (1997) show the excitement made possible through children using digital cameras and producing quality documents. More related to curriculum, Clements (2002) has shown that children working in pairs at the computer engaged more than when working on puzzles on the floor. Yelland (2002) explored the use of computers in the home to develop mathematical ideas and reported that there was considerable potential for computer games to support such learning. Similarly, working at computers has been found to create opportunities for the development of social skills (Lau, 2000). Studies have found that open-ended, child-directed software made a more significant difference in children's developmental gains than did 'drill and practice' software (Haugland, 1997).

The research sought to identify the amount of access and ways in which preschool children used computers in the home. We sought to find out how young children (four–five years) used computers, the skills they were developing, and the links with home and formal
learning environments. We undertook this through a survey in which parents reported their children's use of computers at home.

**Method**

A survey was developed and implemented in a major regional area of Australia. The community has a socially, economically and demographically diverse population of more than 100,000. The survey sought to identify the amount of computer usage by four-five-year-old children; the types of computer usage; the frequency with which children accessed the computer (where and for what purposes); and their skills. Two different scalings were used. Some questions sought to identify where and how young children accessed and used computers (so only a check mark was needed), whereas the frequency of use was documented by Likert scaling, where a 1-3 rating scale was used. There was scope for further comments by the respondents but this was infrequently used.

All centres in the region (n=45) were approached to ascertain their willingness to participate in the study, and surveys were sent to those centres which expressed interest. Centre staff then distributed the surveys to families, who were provided with information sheets, informed-consent forms and reply-paid envelopes for mailing their responses. It was felt that this process would enable families to respond freely and openly.

More than 600 surveys were distributed to the interested centres and 150 responses were received. This made an approximate return rate of 25 per cent.

### Results and discussion

In the following sections we discuss the results collated from the surveys. Using descriptive statistics to analyse the data, we found some interesting and surprising trends. These will be discussed under the key organisers on which the study was based.

#### Computer access

As a starting point, we sought to identify where and how children were able to access computers and the frequency of that access. Some students reported that they had multiple sources of access—a home computer, grandparents' and a parent's work computer, for example. The figures indicate the percentage of students who had particular forms of access. 87.3 per cent of the respondents indicated that their children had access to a computer in the home.

The data in Table 2 suggests that the majority of the respondents accessed computers in their own homes but could also access them elsewhere. Only a limited number (4.48%) reported having no access to computers. Approximately 95 per cent of the cohort have access to computers—with most having access in the home. However, a word of caution is needed here. The self-selection process may have favoured those parents who had computer access in the home. It may be that families without such access may not have returned the survey. However, we would also point out that there were a number of respondents who did indicate that they had no access to computers at all.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Total no. in region</th>
<th>Willing to participate</th>
<th>Responded to survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>9</td>
<td>6 (66.6%)</td>
<td>3 (33.3%)</td>
</tr>
<tr>
<td>Corporate</td>
<td>10</td>
<td>8 (80%)</td>
<td>4 (40%)</td>
</tr>
<tr>
<td>Community-based</td>
<td>25</td>
<td>24 (92.3%)</td>
<td>16 (69.2%)</td>
</tr>
<tr>
<td>Total</td>
<td>45</td>
<td>38 (84.4%)</td>
<td>25 (55.5%)</td>
</tr>
</tbody>
</table>

The table shows the initial expressions of interest and final participation rates. The initial expressions of interest from private/corporate and community-based centres were 66.6 per cent and 92.3 per cent respectively. These figures were calculated on the number of private/corporate/community-based centres in the region so that they are an indication for each sector. Data was received from 33.3 per cent of the private centres, 40 per cent of the corporate centres, and 69 per cent of the community-based centres. Responses were received from 55.5 per cent of the centres in the region. The data indicates that there was an adequate representation of centres from different sectors.

Some centres were hubs where parents from across the region would place their children, whereas others were very much a part of their local communities. Thus some centres were quite diverse in their client base and others were quite homogenous. It was possible to question the data from the latter group about particular social factors in relation to the responses.

### Table 2. Access to computers

<table>
<thead>
<tr>
<th>Sector</th>
<th>Total no. in region</th>
<th>Willing to participate</th>
<th>Responded to survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Girls</td>
<td>81.48</td>
<td>0</td>
<td>7.41</td>
</tr>
<tr>
<td>Boys</td>
<td>91.03</td>
<td>2.56</td>
<td>11.53</td>
</tr>
<tr>
<td>Total</td>
<td>87.31</td>
<td>1.49</td>
<td>9.70</td>
</tr>
</tbody>
</table>

The data in Table 2 suggests that the majority of the respondents accessed computers in their own homes but could also access them elsewhere. Only a limited number (4.48%) reported having no access to computers. Approximately 95 per cent of the cohort have access to computers—with most having access in the home. However, a word of caution is needed here. The self-selection process may have favoured those parents who had computer access in the home. It may be that families without such access may not have returned the survey. However, we would also point out that there were a number of respondents who did indicate that they had no access to computers at all.
Frequency of access to computers

In seeking to understand how young children access and use computers, one survey question was about the frequency of access across a range of settings. We sought to identify how frequently computers were used in the home, in early childhood settings and for various functions—playing/recreation, educational purposes and creative purposes. By seeing how often the computers were used in these various contexts, it would be possible to gain a sense of the potential of the computers.

Using a Likert scale where 0 = never; 1 = sometimes; 2 = regular; 3 = frequent, we asked parents to rate the amount of their children’s computer use for a nominated purpose. Recognising the limitations of using a Likert-scale model—in terms of it not being a continuous scale—we found that using means scores enabled a snapshot of the computer use to be developed. We found the mean score for frequency of use in the home was 1.73, suggesting that students had regular use of computers at home. What did surprise us was the relatively high score of computer use in early childhood settings. The original rating for the data set was 1.04, which suggested that students were able to access computers more than ‘sometimes’ in their early childhood settings. This score presented as an anomaly, as our experience (reiterated in the research literature) suggested that the availability and/or use of computers in the centres was not this high. However, when we re-examined the data, we noted a disproportionately high score for one centre—where there had been a high response rate. When this score was removed from the sample, the mean score was significantly lower (mean=0.30). This suggests that there is minimal access to computers in early childhood settings. However, the removal did not alter the other responses in any significant way, suggesting that the data was otherwise reliable.

### Table 3. Frequency of access and use of computers

<table>
<thead>
<tr>
<th></th>
<th>Home access</th>
<th>Early childhood access</th>
<th>For play</th>
<th>For education</th>
<th>For creative work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total sample</td>
<td>1.73</td>
<td>1.04</td>
<td>1.36</td>
<td>1.28</td>
<td>1.20</td>
</tr>
<tr>
<td>Non-skewed sample</td>
<td>1.58</td>
<td>0.30</td>
<td>1.20</td>
<td>1.18</td>
<td>0.97</td>
</tr>
</tbody>
</table>

In presenting this data, it must be noted that many respondents did not respond to the question about the early childhood setting as they did not know how much access was available to their children. This may be for a range of reasons beyond the scope of this study, and warrants further investigation. It is possible to hypothesise that the non-response of parents to this question indicates a lack of computers in these centres, and suggests that there is a need for concern about this.

### Activities undertaken when using computers

By asking parents to fill in a check-box, we sought to ascertain the types of activities children engage in when using computers. These activities included: playing recreational games; playing educational games; drawing using either programs, drawing tools or open-ended tools such as the mouse; using software packages with nominated purposes; pre-writing activities; copying the behaviour of parents or siblings; using the internet; free play or other purposes. There was also space provided for responses we had not anticipated. This option was not used, suggesting that the survey question identified the main activities undertaken by children.

<table>
<thead>
<tr>
<th>Activities undertaken while using the computer</th>
<th>Total (%)</th>
<th>Use by girls (%)</th>
<th>Use by boys (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Games – non ed'l</td>
<td>59.90</td>
<td>42.31</td>
<td>72.09</td>
</tr>
<tr>
<td>Games – ed'l</td>
<td>79.54</td>
<td>73.41</td>
<td>83.21</td>
</tr>
<tr>
<td>Drawing</td>
<td>48.92</td>
<td>50.02</td>
<td>48.18</td>
</tr>
<tr>
<td>Software packages</td>
<td>15.50</td>
<td>11.03</td>
<td>18.61</td>
</tr>
<tr>
<td>Pre-writing activities</td>
<td>20.68</td>
<td>20.01</td>
<td>21.15</td>
</tr>
<tr>
<td>Modelling (copying behaviour)</td>
<td>15.67</td>
<td>18.96</td>
<td>13.39</td>
</tr>
<tr>
<td>Internet</td>
<td>39.76</td>
<td>26.35</td>
<td>49.05</td>
</tr>
<tr>
<td>Free play</td>
<td>28.19</td>
<td>19.18</td>
<td>31.05</td>
</tr>
</tbody>
</table>

The data suggests that young children were accessing computers in a variety of ways that develop a range of computer skills, knowledges and dispositions. It indicates that there is considerable use of computer games and that the use of drawing tools features strongly, with nearly half of the children undertaking this activity. Almost one third of the children use the internet. From the comments provided by parents, it could be seen that, typically, children were using the internet for accessing websites such as The Wiggles. Such sites have been designed for the young user but still require levels of competence with the mouse and other aspects of the computer. Similarly, many of the games call for mouse skills in order for the user to navigate their way around the games environment. The eye-hand coordination needed for this competence is a very different skill from the traditional eye-hand coordination that has been a feature of early childhood development. The new skill is through a medium where the correspondence between the hand and the action is not direct, whereas traditional modes have been far more direct.
Computer skills of young children

Having identified how young children are accessing computers and for what purposes, we sought to identify the skills they were developing as a consequence of their interactions with computers. The results in Table 5 indicate the parents' perceptions as to whether their child had developed competent skills in the nominated areas.

Table 5. Computer-related skills developed by children

<table>
<thead>
<tr>
<th>Skills</th>
<th>Total (%)</th>
<th>Use by girls (%)</th>
<th>Use by boys (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turn off/on</td>
<td>25.56</td>
<td>20.37</td>
<td>29.49</td>
</tr>
<tr>
<td>Use mouse</td>
<td>80.45</td>
<td>72.22</td>
<td>87.18</td>
</tr>
<tr>
<td>Find letters and/or numerals</td>
<td>47.73</td>
<td>46.30</td>
<td>48.72</td>
</tr>
<tr>
<td>Type letters</td>
<td>42.11</td>
<td>35.19</td>
<td>47.44</td>
</tr>
<tr>
<td>Retrieve files</td>
<td>7.52</td>
<td>3.70</td>
<td>10.26</td>
</tr>
<tr>
<td>Use pull-down menus</td>
<td>12.03</td>
<td>5.56</td>
<td>16.67</td>
</tr>
<tr>
<td>Use drawing tools</td>
<td>30.08</td>
<td>24.07</td>
<td>34.62</td>
</tr>
<tr>
<td>Use touch pad</td>
<td>18.80</td>
<td>18.52</td>
<td>19.23</td>
</tr>
<tr>
<td>Load CD/DVD</td>
<td>38.84</td>
<td>31.48</td>
<td>41.03</td>
</tr>
<tr>
<td>Save files</td>
<td>4.51</td>
<td>3.70</td>
<td>5.13</td>
</tr>
<tr>
<td>Use the tool bar</td>
<td>13.53</td>
<td>9.26</td>
<td>16.67</td>
</tr>
<tr>
<td>Print documents/files/sheet</td>
<td>17.29</td>
<td>20.37</td>
<td>15.38</td>
</tr>
<tr>
<td>Type words</td>
<td>16.54</td>
<td>14.81</td>
<td>17.95</td>
</tr>
</tbody>
</table>

This data suggests that preschool children have developed a high number of skills through their interactions with the computer. That nearly half of the cohort uses the computer for literacy development may indicate the emergence of multiliteracies among young Australians. Many parents reported that their children used the computer for finding/recogising letters, and typing letters and/or words. This may be an interesting development in early literacy skills because, while many young children lack the capacity to properly form the letters of their own and other names, the computer enables them to construct well-formed letters and words without the fear of making mistakes. As reported elsewhere (Zevenbergen, 2007), the keyboard, sizing and print tools enable young children to create their names (and other words, as well as numerical symbols) in a variety of ways not previously possible.

More than 80 per cent of respondents identified that their children had well-developed skills with the mouse. We find this an interesting phenomenon as there is not the direct link between hand and eye movements, as is commonly valued in the early childhood sector.

We also draw attention to the parental reporting that 30.08 per cent of the cohort used the computer for drawing. This finding supports the earlier responses that computers were being used for creative work. Our intention with this survey question was identification of the use of the drawing tools menu where children could use the various options in the pull-down menu. However, we also recognise that many software programs enable children to create freehand drawings by using the mouse, as well as to use various tools, such as moving/organising objects within a space.

Gender differences

When analysing the data, we also separated the cohort by gender. This was not an intention in the original design of the project, as we were not expecting to see too many differences in this early age group. In presenting this data we are aware that it may be as a reflection of gender difference in behaviour as much as about gender perceptions of parents. However, we contend that perceptions are often the reality for many people, so, if parents report a particular phenomenon, the perceived differences can become real differences.

Gender differences in computer usage

Initially, the project sought to identify the ways and degrees to which young children were accessing and using computers. As part of this investigation, parents were asked to indicate if their children used the computer for different activities. These included turning the computer off and on; using the mouse and/or touchpad to allow for the different computers—desktop or laptop—that the children may access; recognising and finding letters and numerals; loading disks; typing letters, words and numerals; saving work; retrieving files; using the tool bar; using pull-down menus; printing work; and using drawing tools. An option for indicating other skills the children may have was included but there were few responses. What could also be seen from the data were quite clear gender differences. In this section we discuss these differences but also draw attention to the general trends in how young children were using computers.

As Table 5 illustrates, parents reported that boys were more frequent users of the computer in all areas except for printing. A similar finding came from the data where parents indicated the types of activities their children undertook while using the computer. These results are displayed in Table 4, where it appears that boys were more likely to use the games—both educational and non-educational—then were girls, and that they were also more likely to use the internet and to play with the computer in a general sense. These differences have been noted in the literature with regard to older students, but this new data suggests that the differences
between the genders are emerging at a very early age, and that different patterns of computer use may be appearing quite early in children’s development.

**Computer skills by gender: A contradiction**

Table 2 shows the differences between the genders in the access they have to computers. It shows that boys generally have greater access across a range of situations, and that girls are more likely to be in situations where they have no access.

For us, this data is alarming in that it shows that, even as early as four or five years of age, gender differences can be seen to be emerging both in terms of how computers are being accessed and in skill development. However, we reiterate that these may be perceptions of parents as much as gender differences among the children.

**Conclusion**

The data presented in this paper also highlighted emerging gender differences in access to computers and how computers are being used by young children. If these trends are representative of the general population, then it would suggest that the early childhood sector may need to address such differences before they become so substantial as to impact significantly on learning and learning outcomes. Early intervention may arrest any potential differences that could manifest into real differences upon entering school. In making this claim, we draw on the literature provided by Gee (2003) and his games theory as it applies to education.

The data from our survey may be skewed to those families who have computer access in the home. If this is the case, there is a need for early childhood providers to be acutely aware of the differences in the access of families and children to these technologies, which may be creating potential for considerable differences in skill development and very different learning opportunities for children. Computer access in early childhood settings should be improved so as to reduce digital divides among early childhood learners. This would seem to be a priority if some children are not having computer access in the home and not developing the skills and dispositions as has been noted in this study.

**References**


