A QUALITATIVE EXAMINATION OF SOCIAL INTERACTION DURING COOPERATIVE COMPUTER ACTIVITIES

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This article reports the findings of a study to examine the practicality and efficacy of using tablet computers in the Higher Education classroom. Students in a senior level teacher preparation class were provided with Apple iPads for 10 weeks to aid in their studies. The iPads were preloaded with selected software but students were encouraged to use them in the way that felt the most natural and beneficial to them. Results indicated that students thought that the device was most beneficial as an e-reader and a way to have instant access to information while the instructor was lecturing. They also found it to be beneficial in their clinical work in elementary school classrooms.

Since the mid-1980s when computers began to be introduced into classrooms,there have been dramatic changes in education. Increasing numbers of teachers use computers to facilitate their curriculum and classroom activities (Macaruso & Walker, 2008; Zevenbergen, 2007; Spooner, 2004; Stephen & Plowman, 2008). With the advent of social media, smart boards and pad based this trend is expected to increase. Some researchers and teachers have debated the appropriate age at which children should be introduced to computers (ABC News, 2010). Some research has demonstrated that preschoolers can benefit if using computers in developmentally appropriate ways (Schmid, Miodrag, & Di Francesco, 2008; Stephen & Plowman, 2008; Buckleitner, 2007). Other research researchers either claim that there is simply not enough research detailing the impact that computers have on the development of young children's minds and bodies or claim that computers can have an outright negative effect on development (Ferguson, 2005; Klerfelt, 2004; Elkind 1996).

Elkind (1987) even stated that the use of computers in preschool "…is a good example of miseducation" (p. 87). One of the concerns is that computers may lead to isolation, diminished social interaction,and deficiencies in language (Barnes & Hill,1983). Healy (1998) is concerned that when young children spend an overabundance of time with computers,the development of the child's brain may be impeded by a lack of social interaction with others. Anecdotally, the researchers have noticed that many parents feel the same way about the use of computers and video games with their own children.

On the other side of the debate, research has demonstrated that preschoolers can benefit if using computers in developmentally appropriate ways (Macaruso & Walker, 2008; Sarama & Clements, 2007; Schwall, 2005). The National Association for the Education of Young Children (NAEYC), has endorsed the importance of computers for children in preschool (NAEYC, 1996). According to NAEYC, computers can be an integral and inevitable component in the early childhood classroom if used in a developmentally appropriate manner. Many researchers are finding that a new generation of children is interacting with computers in very different ways than in the past. This is also aided by a new generation of touch screen and hand held devices that actually promote interaction in the same way that reading a book can. This evidence suggests that computers have been found to help children with cognitive, verbal skills, concrete experiences, long-term memory, and social-emotional growth when successfully applied in developmentally appropriate classrooms (Papert, 1998 Ljung-Djärf, 2008; Macaruso & Walker, 2008; Stephen & Plowman, 2008).

The present study attempts to study the types of social interactions that take place when preschool children interact with computers. The conventional wisdom is that computer play is solitary or parallel play at best and discourages social interaction and interaction amongst peers. An opposing view contends that computers stimulate discussion and social play using new media, and while a different paradigm from traditional play, the benefits are the same. This study attempts to address the following questions:

1. What kind of social interaction occurs when children are using the computers for play or work?
2. What are the patterns of collaborative interaction when children are engaged collaboratively with the computer?
3. How is the activity on the computer influencing the children's social-emotional development?

Methodology

This research study was conducted at a University laboratory school. The participants are 52 children (31 boys and 21 girls) ages of subjects were from 3 to 5. They were exposed to play on computers for at least 6 months before this study began. A pre-observational parent survey showed that 95% of the children have computers at home and 100% of parents report that their children have experiences with playing on the computer. When they do daily classroom activities, every child has free opportunities to select what they want to do in the classroom. Using the computer is one of the classroom activities they may choose. When the children chose the activity of playing with the computers, all participants were observed from the time they sat in front of computer screen until the time they left the computer station. Their parents had given informed consent for their children to participate in the study.

Setting

There is one computer set up in a comfortable and bright place in each of the three preschool classrooms observed. In

Room A, the computer is located inside the classroom. In the Rooms B and C, the computer is located outside the classrooms, in the hallway. The table and chairs is suited for children's height and the open space around the computer stations allows them walk without limitations. Several multimedia software titles and CDs are available on the shelf easily accessible to the children. The PC has already installed appropriate software for children to operate it easily and conveniently.

Because computer playing took place during free–choice time, teachers did not have any curricular and instructional design for the activities. Teachers did not control children's behaviors or discussions. Teachers only became involved if a conflict occurred or was likely to occur. Teachers were also interviewed after the observations to collect their feelings and observations about the computers in their classroom and the children's interactions with it.

Findings

Based on the data of the field notes of observations and the transcriptions of interviews, the researchers coded, analyzed and categorized four important themes.

1. Children interacted socially in many different ways without adult guidance

When playing at the computer, this study found that children usually choose to play with a partner rather than individually or alone. During the joint computer activities children showed many both prosocial and antisocial ways of interacting with the computer partner. Both ways of interacting included social problem solving without the aide of a teacher.

The patterns of cooperative interactions exhibited by preschool children while engaging cooperatively with the computer showed that one person would take the role of "controller". This person would have control over input devices and would usually be the main participant initiating action on the screen. All other children would have varying degree of input, from making suggestions to cheering on the controller. These children were deemed "partners".

Most of time, the controllers accepted their partners' guidance easily and happily. They enjoyed the guidance and help from their partners. During the interactions, partners with different competences provided each other with skilled assistance that reached other's ZPD (Vygotsky, 1978). When controller felt frustrated with the action on the computer, they did not hesitate to ask questions to their partners. Younger children asked for help more frequently than older children did. Through this interaction, children worked cooperatively. Many times this cooperation took the form of peer tutoring. When one student was in need of assistance, they often asked their partner for assistance.

Child (#15) was the controler with her partner (#6).
Computer: Where is the cookie jar?
Child (#15): That's the food. I don't know where is the cookie jar?"
Computer [continued]: Where is the cookie jar?
Child (#15): "I don't know. Can you

help me?" [She looked at her partner (#6).]
Child (#6) moved the mouse and said, "Here". He provided the help and directed Child (#15) how to solve the problem.

The majority of controlers shared controlling with their partners positively, especially, the partners they played with frequently. When their partners had more computer skills, learning skills, and knowledge, most of the children released their powers of control of the input devices frequently and enjoyed working with their partner in control.

A pair of children is sitting at the computer. One was the controller, and the other was a partner. Sometimes, the partners would provide guidance, suggestion, and opinions to the computer controllers. On the other hand, the controller directed or guided his or her partner's thinking and behavior.

[Child (#9) played the computer and Child (#1) stood up to watch.]

Child (#1) [pointed the screen]: I might choose that one….black….yeah.

[Child (#9) did what he said.]

Child (#1) [pointed the screen]: Don't do that…do this…click on it.

Child (#9) [did not say anything but just followed her partner's (#1) suggestion.]

In another example, Child (#3) played the software with Child (#7).

Child (#7): he [the character] needs that hand. [Pointed the screen]…I'm that guy.

Child (#3): I want to change this.
Child (#7): Ok! Do it.
Child (#3): Ok, I did.
Child (#7): where? Put that ghost's hands.
Child (#3): haha…
Child (#7): put that hat.
Child (#3): Ok, I know, I know. Oh, cool.

Children in this study showed their pleasure at the cooperative play, such as winning a game, completing a task with a partner, and getting the funny animations or songs. Young children were more satisfied when working with partners than when working alone.

However, the interactions were not always positive.

Child (#2) sat in front of the computer alone. Child (#6) came to join with him. Child (#6) found that Child (#2) chose the wrong way, so he tried to grab and control the mouse. Child (#2) said, "Stop it." He grabbed back the mouse and looked at his partner (#2) angrily. He pushed him (#2) away. The action of grabbing was happened when one child did not accept the other's direction.

In another observation, when the coloring program was setting, Child (#3) used mouse to click on the color platform to create a picture, at that time Child (#7) came to watch.

Child (#7): put the moon fire.
Child (#3) [colored the moon red.]
Child (#7) [found that was wrong]: let me do. [tried to control the mouse]
Child (#3): no. [grabbed the mouse

back]

Child (#7): I say it's my time. … there…Quit it.

Child (#3) hit his partner (#7)'s head, and said, "Please go away".

When Children had conflicts with their partners, they performed strongly to express their desire of control. When Child (#11) played the computer and her partner (#4) came to watch.

Child (#4) [pointed the screen and directed her partner]: go to there…go the way there….make it higher….go there….go there….

Child (#11)[hit her partner (#4)'s hand]: I know.

Child (#4) [pointed the stop sign]: go there go there.

Child (#11): no, no, I want to do that later.

Child (#4) used the keyboard to control the arrow and direct the game. When Child (#11) found out, she became very angry. She pushed her partner's (#4) hand away, and hit her left arm and said, "Stop it". Child (#4) left frustrated.

Most of the conflicts in preschool classrooms were rather brief. Some children did not agree with their partners and strongly presented what they wanted. Thus, when disagreement, quarrelling, argument, and squabble occurred, children rejected against their partners' help or control. However, several events in this study showed that children ignored their partners' instructions and behaviors. Most of time, older children cared less about the opinions of their younger partners than younger children did. The older children paid more attention and respect to their same or older-aged partners.

2. Gender had little influence on children's computer usage and types of interactions.

In the study, the issue of gender did not influence children's computer usage. Girls like to use computers as much as boys. More importantly, it was found that mixed-gender partnerships led to greater peer interactions. Most of the peer interactions happened in the mixed-gender groups. However, most conflicts occurred in same-gender dyads (Alexander & Hines, 1994). The boy-boy dyads created more conflicts than the girl-girl dyads. The girls in the girl-girl groups offered and required more help than boys in the boy-boy groups. Teachers should teach boys how to use self-control. In addition, teachers need to ask boys to observe their partners' behaviors and imitate them. In mixed gender groups, however, boys were not observed being more dominant than girls in asserting their desire to be the controller. Most mixed gender dyads were evenly balanced between girl led and boys led.

3. The age of the participants influenced the social interactions at the computer.

The findings suggest that children prefer to interact at the computer with different aged peers who can offer more stimulation and opportunities to children's social development. The younger children especially preferred to use the computer with older partners who have more competence and are viewed as ideal models for facilitating cognitive and behavioral development.

Feedback from the teachers who were interviewed in this study indicated that age issue was not a problem that influenced peer interactions in using the computers. However, observations showed that conflicts often happened in the mixed-age groups even though they were a more popular choice for the children. Sometimes younger children cannot control their emotions and time management. On the other hand, older children have more language and technological skills. They have better social cognition to negotiate with partners and solve problems.

Young children used more non-verbal actions than the older children while using computers with partners such as pulling hairs, scratching, pushing, yelling, crying, or shouting. Those emotional behaviors sometimes affected peer interactions both same age and multi-age. In this study, younger children showed displeasure more frequently than their older peers. Most of the younger children were usually egocentric and did not control their anger. Sometimes, they easily lost their temper over issues such as turn taking, limited time, and not controlling the mouse well. Fortunately, displeasures in the preschool classrooms were brief and disappeared quickly.

4. Arbitrary time limit imposed by the teacher had an effect on the social interactions

The study showed that setting time limits influenced children's development of peer interactions when they played on the computer with partners. Time limits were implemented to ensure fairness of use in the classroom. A timer was used to remind children of the time setting and to monitor children to take turns fairly.

However, the time limit also tended inhibited certain peer interactions. Some children showed displeasure or aggression when they reached their time limit. Some children wanted to continue the game or program when the timer went off. Children sometimes had such difficulty in handling their emotions at that moment and they often cried, yelled, or were even aggressive.

Some children may have had good friendships and cooperative process with partners while playing on the computer, but fought or argued with that same partner when the time was up. Setting time limits seems to allow for a social order, and yet it is not desirable or even developmentally appropriate to interrupt children who are engaged in intellectual activity. Giving children long periods to experience and interact with materials is accepted with other classroom materials such as puzzles, manipulatives, reading and writing tools, and blocks. However, because of the limited nature of the computer resources, time limits are common among computer usage. This is an issue that each classroom teacher needs to address talking into account their children's needs and their classroom computer resources. Perhaps as lower cost, more portable devices such as pad based computers become more available in the classroom, the computer can become more like other desirable materials in the classroom in the way their use is shared.

Conclusion

Computer play is no different from other forms of play in which children engage. There is social interaction and conflict that children work to resolve and there is intellectual discussion about how to achieve the goals of the play. Far from being a quiet solitary activity, this study found that children's computer play is vibrant and interactive.

In 2010, computers are still a limited resource in many classrooms, but are a popular choice for children. Finding developmentally appropriate ways to encourage developmental play and use of the computer will be a challenge for the teacher, however as prices and size of devices drop, the time when there is just one computer "station" may be coming to an end. Perhaps having 5 pad based computers rather than one large computer "station" will become the norm and solve many of the problems observed in this study while preserving the interactive nature of the computer activity.

When computers are set for multifaceted uses, there are more opportunities for children to develop their peer interactions. The quality and quantity of computers are important issues that teachers and administrators should consider to promote social interactions based on the findings of this study.

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