The Effects of

Computers on the Social Behavior

of Young Children

An Honors Thesis

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by

Todd Heft

Advisor: Dr. Sudha Swaminathan

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Abstract

The purpose of this thesis was to examine children's social behavior at the computer, particularly their peer interactions and their interactions with the teacher. Fourteen preschoolers were observed while they worked at the computer over the course of 2 months. Data was collected through observations, informal interviews of the children, and interviews of the teachers. Results found a total of 91 peer interactions and 33 teacher interactions over the course of the study. The interactions included children observing and acknowledging each other, children commenting and being ignored, and children sharing or helping each other. Implications of the study emphasize the value of using developmentally appropriate software and the need for teachers to facilitate greater cooperative peer interaction.

<center>The Effects of Computers on the Social Behavior of Young Children</center>

The purpose of this thesis was to examine how computers in the classroom effect children's social interactions. Children often use the computer on a daily basis to enhance their academic skills but social behavior may also be influenced by time spent on computers. I specifically looked at how children interact socially while using the computers in the classroom.

The study involved observations of children at the computer together with interviews of teachers and children. The insight gained from this study can help teachers and software developers better utilize computers to educate children.

Social interactions such as turn taking, conflict resolution, and problem solving are often observed by teachers and others when pairs or groups of children are using the computer. Children often need to be taught the technical skills necessary to successfully use the hardware and software in the computer. Teachers must guide children in a manner that they can easily understand. Teacher-child interactions at the computer often center around problem solving, but may also include keeping children on task. Constant teacher presence may inhibit children's interactions with each other. It would therefore be beneficial for the teacher to understand how the computer effects children's social behavior.

Research Purpose

This research:

- examined children's interactions with peers on the computer

- examined how teacher interactions effect children while on the computer.

Review of Research

There has been debate since computers entered the classroom over whether or not they belong there. Recently many studies are showing that computers benefit children. Open ended software programs often stimulate discussion (Clements & Swaminathan, 1995) This increased discussion has led many children to prefer working with a partner rather than alone (Clements, et al., 1993); (Haugland & Wright, 1997) This interaction dictates how children view the computer and how it is used.

When working with computers, children's behavior is influenced and enhanced by a number of different things. Computers must be used carefully, particularly with a knowledge of how they impact social behaviors within the classroom. A review of recent research indicates that factors such as gender, peer interactions, type of software, and teacher instruction and intervention can affect children's interactions on the computer. These factors can make a computer in the classroom either an enhancement or a burden.

Gender

The effects of gender on children's computer interactions has long been disputed with the results pointing to, but not definitely, that gender has no influence on their social interactions. Gender differences are less visible in younger children. Bergin (1993) found almost no gender differences in kindergartners. This result is not overly surprising. When children first use a computer they are all starting from the same level. Most differences may come from stereotyping children based on gender, not on actual intellectual differences (Newman et al., 1995.) Newman (1995) found that young girls who were stereotyped did not achieve as well as boys.

The amount of computer use by gender varies. This may be why boys appear to do better than girls. Boys often favor using the computer more than girls (Haugland & Wright, 1997.) Who uses the computer more may also be a result of teacher interaction, software or even placement of the computer within the classroom (Haugland & Wright, 1997.) Subtle changes may make a world of difference in how the computer gets used.

There is a tendency for people to say that boys are the predominant users and often work more efficiently. Yelland (1994) did find that in the beginning boys were able to work faster and more efficiently than the girls. It is interesting however, that girls, after a period of time, appeared to excel ahead of boys. This result points to a gender relation that contradicts other research on gender differences. Another study has shown that girls are behind in every category academically when using computers (Sutton, 1989) This means that girls often do not do as well at computer as compared to boys. One other interesting observation that has been made is that boys often perform better on post-tests (Clements & Swaminathan, 1995)

Peer Interaction

Children's interactions while at a computer include a wide range of social skills. Developing these social skills at an early age will benefit the child in later years. As a result of limited computer resources and by recommendation, children often work in pairs or groups when using the computer (King, et, al. 1989.) Computers can often "force" children to talk to each other about the task at hand. It is often necessary for children to talk about their work while working at the computer. These interactions often include conflict resolution and cooperation.

When children are on the computer, primary issues such as who will type or use the mouse and who will make the decisions must be resolved. Children go about this in different ways. Sometimes one

child will dominate over the other with little or no interaction, but more often children discuss how things will be run. Teacher intervention is sometimes needed when children cannot resolve a conflict. It is important that the teacher realizes that "each conflict should be viewed as an opportunity to teach and guide the children," (pp 194, Stone, 1993.) This can make a tremendous difference in how the children view the computer.

Whether it be the technical aspects of using a mouse, the location of a key on the keyboard, or conceptual issues such as problem solving, children need guidance with new technology. When children are working together, they are more likely to ask their peer for help than the teacher (Clements, 1994);(Haugland & Wright, 1997.)

Designing stories on the computer has proved to be an excellent method for children to improve both writing and social skills. Children can use their stories to interact with one another (Haugland, 1996) They can read their stories to a partner or to the class. This rich social interaction should put aside any concerns that computers isolate children from one another (Haugland & Wright, 1997) It is promising to see that children can improve their scholastic skills while socializing and having fun.

Teachers may become concerned with the amount of socialization that occurs when children are using computers. Teachers fear that children will get off task and begin discussing matters unrelated to their work. Children often socialize nine times as much at the computer than when working with puzzles (Clements & Swaminathan, 1995) These high levels of verbal communication are a positive sign. This often means the children are openly discussing the problem amongst themselves in order to come up with the best possible solution (Clements, 1994)

Type of Software

The quality of software used in the classroom determines whether it will be an asset or a burden. The National Association for the Education of Young Children says that technology in the classroom can be a positive influence, as long as it is used appropriately, applying the guidelines for developmentally appropriate practice, DAP (NAEYC, 1996) DAP software can enhance children's academic content knowledge by providing an interactive interface (Clements, Nastasi, & Swaminathan, 1993) DAP software also encourages participatory learning and provides a holistic learning environment (Haugland & Wright, 1997)

DAP software helps enrich a child's mind. Studies have shown that children using DAP software have gained in intelligence, non-verbal skills, structural knowledge, long term memory, and complex manual dexterity (Haugland, 1992) These children were using a program that required them to remember certain pieces of information throughout the program. One study in Los Angeles used DAP language software to help kindergartners with reading and writing (Klentschy & Hoge, 1991) A mouse or other pointing device was also used, resulting in increased dexterity. It is encouraging to see that not only knowledge is gained by using developmentally appropriate software, but also physical motor skills.

DAP software stimulates positive emotions in children. Children's emotional response to developmentally appropriate software was much more positive than that of children using non-DAP software (Shade, 1994) When using DAP software children had significantly greater gains in self-esteem (Haugland, 1992) Storytelling programs often encourage children to interact with one another and this again can bolster children's self-esteem (Haugland, 1996) Software can play a tremendous part in enhancing not only the classroom but also the children as individuals. DAP software is therefore a critical element in computer learning.

Teacher Interaction

The teacher plays an important role in stimulating children to use the computer in an appropriate way. The teacher must first select an ideal location for the computer in the classroom. As mentioned before, where a computer is located can determine who uses the computer and when. Often times the middle of the room is appropriate because every child can see it (Haugland & Wright, 1997)

The teacher must also select the software that the children will use. It is important that teachers choose software that is developmentally appropriate and provides a variety of opportunities for exploration (Haugland & Shade, 1994) As mentioned, DAP software can make or break the use of computers in the classroom. The purpose a teacher has for the computer can determine how it is used. If a classroom teacher has academic learning in mind a drill and practice type software may seem more effective (Cosden, 1988) It may however, not give the desired result in the long run.

Teachers may question the effectiveness of children working at the computer in groups. They may feel that there is too much social interaction and distractions for the children to work well (King, et al., 1996.) However, often times the children's conversations on computers are related to the task at hand. This interaction should be monitored and observed, but not interrupted unless it disrupts their work. Some guidelines for teachers using groups have helped. These include questioning whether students in groups work cooperatively and the extent to which they stay on task (King, et al., 1996.) Asking questions such as these may assist a teacher in deciding which groups work and which do not.

The teacher must also decide how much to observe the children and how much help to give. As mentioned earlier, students will often ask each other for help. This should be of particular interest to the teacher. Teachers may decide that students will gain a greater understanding of the computer and the material if they are left alone. It is also important to note that some studies have revealed that teacher

monitoring diminishes group discussion (King, et al., 1996.) Teachers should understand that child interaction is primarily a positive force when working on computers.

Children with Special Needs

Children with special needs can also greatly benefit from computers in the classroom. As mentioned earlier, motor skills can be improved by using DAP software. Special education teachers often use computers with social learning and entertainment in (Cosden, 1988) This may lead these teachers to using a more DAP software program by nature. This should greatly enhance the effectiveness of the software for children with special needs.

Computers can sometimes "perform" minor miracles. One student, who could not talk, was able to attempt words, and others with limited attention span were able to interact with the computer for extended periods of time (Schery & O'Connor, 1992) These improvements may take a great deal of time but they show that the computer can help. Computers can help children with physical impairments and therefore compensate for typical learning challenges (Brett, 1997) This can also lead to a more positive feeling of self worth.

The review of research yielded insights into classroom expectations and indicated that variability in peer interaction is dependent on the software and the intervention of the teacher. It is the purpose of this study to understand the social behavior of preschoolers within this framework.

Methodology

Participants

Children

This qualitative research study took place at the campus preschool/child care center of a state university in New England. The study began in October of 99 and concluded in December of 99.

During this period a group of 14 children ages 3 years 5 months to 4 years 8 months were observed a total of 11 times (See Table 1.) The parents of these children had given their permission to participate in this research (See Consent form in Appendix A.) These observations took place in the afternoon from approximately 1:30 until 2:45, and lasted between 5 minutes and an hour and fifteen minutes.

The children were observed during their choice time. During this time the children had a choice of computer, snack, books, blocks, dramatic play or art. The children could do any number of these things during the hour and fifteen minutes. Immediately before and after this choice time was outside play. At any given time there were at least four teachers in the room with the children.

Children worked on individual computers that were placed side by side. Sometimes an additional child would join as an observer. All observations of the children were done as a non-participant observation with field notes being the primary form of data collection. Two observations (11/3/99 and 11/10/99) were videotaped. Two children, George and Adam, were informally interviewed at the end of the study to better understand their feelings about using the computer.

The software used at the child care center was Kidsware 2. Within this software there were several different programs that the children could choose from. The include, city, farm and winter scene creation games, animal creation, painting, counting with flowers, and others.

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Insert Table 1

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Table 1: List of children, their ages, dates and times observed

Child (gender)	Age	Dates Observed	Number of Times Observed
Adam (m)	4 years 5 months	10/20/99, 10/25/99, 10/29/99, 11/5/99, 11/10/99, 11/22/99, 11/29/99	7
Caitlin (f)	4 years 1 month	10/20/99, 10/25/99	2
George (m)	4 years 5 months	10/18/99, 10/20/99, 10/25/99, 10/29/99, 11/1/99, 11/3/99, 11/10/99, 11/29/99	8
Aaron (m)	4 years 8 months	11/1/99	1
Tracy (f)	4 years 6 months	10/20/99, 11/10/99, 11/22/99	3
Vanessa (f)	4 years 2 months	10/20/99, 11/10/99, 11/22/99, 11/29/99	4
Daniel (m)	4 years 8 months	10/29/99	1
Jessica (f)	4 years 7 months	11/8/99, 11/22/99	2
James	4 years 5 months	10/18/99, 11/1/99, 11/3/99, 11/29/99	4

(m)

Helen (f)	4 years 4 months	10/18/99, 10/20/99	2
Austin (m)	4 years 4 months	11/10/99	1
Steven (m)	3 years 9 months	10/18/99, 10/20/99, 10/25/99, 11/3/99, 11/5/99, 11/22/99	6
Christina (f)	3 years 10 months	10/18/99, 10/29/99, 11/1/99, 11/3/99, 11/8/99, 11/10/99	6
Jack (m)	3 years 5 months	11/22/99	1

Teachers

Two teachers were interviewed in order to get a clear understanding of the purpose of the computers in this classroom. Each interview lasted approximately 10 minutes. (See Appendix A for a sample interview) The teachers were asked the following questions:

1. How are children encouraged to use the computer?

2. Are children encouraged to work together at the computer?

3. How do children react when you are helping them on the computer?

4. Do the children openly ask for your help while on the computer?

5. Do you help the children and interact with them on a regular basis or do they work independently?

6. Do the children with special needs use the computer as often as those without special needs?

7. Do the children resolve conflicts themselves when on the computer or is teacher intervention often needed?

8. How is the computer hardware and software chosen?

Data Collection

The data for this study were the observations and interviews of the children as well as the interviews of the teachers. The data were collected from

1) On computer interactions of the children, collected as:

♦ field notes as a non-participant observer (See sample in Appendix A)

♦ videotaped recordings of their interactions on two days

♦   photographs of their working together

2) Informal interviews of two of the children (See sample in Appendix A)

3) Interviews of two teachers (See sample in Appendix A)

Data Analysis

Data was analyzed using the analytic induction method (Erickson, 1986) All data was perused

repeatedly for significant patterns pertinent to the research questions. Triangulation of data analysis was

achieved through interviews of the teachers and the children. Also, randomly selected portions of the

data were read and analyzed by a person who was blind to the purpose of the research.

Results

Data analysis yielded the following significant patterns of interactions, namely interactions

between peers, interactions between teachers and children, and conflicts. Table 2 provides the

frequency of occurrence of these patterns on each day of the study. These interactions are described in

detail in the following sections. Individual children's interactions are also discussed as related to the

above patterns. On 11/8/99 there were no peer interactions because the children only used the

computer for a period of five minutes.

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Insert Table 2

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Table 2: Frequency of occurrences of patterns of interactions

Date	Duration of observation	Peer Interactions			Teacher Interaction	Conflict	Total
		Children Observing Each Other	Sharing Helping	Child Being Ignored			
10/18	32 min	16	4	4	2	2	28
10/20	29 min	5	0	0	1	0	6
10/25	23 min	6	2	0	2	2	12
10/29	43 min	1	2	1	2	0	6
11/1	32 min	7	1	1	3	2	14
11/3	49 min	13	0	3	2	6	24
11/5	20 min	4	0	0	2	0	6
11/8	4 min	0	0	0	0	0	0
11/10	40 min	7	1	0	12	3	33
11/22	43 min	8	1	0	5	3	17
11/29	17 min	4	0	0	2	0	6
Total		71	11	9	33	18	

Peer Interactions

Over the course of the study, there were 91 occurrences of children interacting with each other in an explicit manner. On certain days more interactions between children were observed than on other days. The duration of time that each child spent at the computer on any given day was determined by the children themselves. On 10/18/99 and 10/20/99 both observations were approximately the same time, yet the number of peer interactions were drastically different (20 and 5, respectively) On 10/20/99 a total of seven different children used the computer while on 10/18 on five used the computer. On 11/3/99 there were a total of 16 peer interactions observed. This is one of the days that was videotaped. The videotaped observation allowed for a keener look into what was happening at the computer. On 11/5/99, 11/8/99, and 11/29/99 the total number of peer interactions were 6, 0, and 6 respectively. All three of these observations were less than twenty minutes. On 11/5/99 and 11/8/99 only 2 different children used the computer. On 10/29/99 the observation lasted 43 minutes but there was no clear pattern indicative of why there were so few interactions on this day.

The following are the patterns observed within peer interactions.

1. Children observing and acknowledging each other
    a) One child observes another child but has no reaction
    b) One child observes another child and does the same without comment
    c) One child observes another child and comments but does not do the same
    d) One child observes another child and comments then does the same
2. Children Commenting and Being Ignored
3. Children sharing or helping each other

1. Children Observing and Acknowledging Each Other

The children were often observed looking at each other's computers and discussing their work while on two different computers. This occurred with sometimes no verbal communication and at other times with one child saying something to the other.

a) One child observes another child but has no reaction

In this situation, a child would be using his or her computer and would comment on something that he or she had just done. The child at the other computer would look over and acknowledge in a non-verbal manner that he or she had heard and understood the child speaking, but would do nothing more. This occurred a total of 29 times over the course of the study. This was noted the most times (10) on 11/3/99, an observation which was videotaped. This occurred most when the children first sat down to use the computer.

The following occurred at the beginning of an observation of George and Christina. George was using the animal creation program and Christina was using the flower game. George clicked and suddenly a body of a lion appeared.

> "How'd it do that?" George exclaims.
> Christina looks over at George's computer.
> George and Christina exchange glances.
> George then says to Christina "When the legs went like that, (walking across the screen) I pressed that (button on the keyboard) and the lion went walking"
> (11/3/99)

George commented about the computer and Christina looked over but she did not say anything.

b) One child observes another child and does the same without comment

In this situation, a child would be using his or her own computer and would comment on something that they had just done. The child at the other computer would look over and acknowledge in a non-verbal manner that he or she had heard and understood the child speaking, then would do the same thing on his or her own computer. This occurred 20 times over the period of the study. A variation of this pattern was when one child would simply look at the other child and then close his or her program and open the one the partner was using. The following observation shows George clearly looking at his counterpart's screen to mimic the action.

James then begins making another animal with zebra feet. George does the same. James then adds a camel body, a deer head and a polar bear tail. George looks carefully at James's animal and does the same. Their animals then walk across the screen.
(11/1/99)

George carefully watched James to mimic his animal exactly. This example clearly shows that children can parallel each other's work on the computer without using words.

These observations have shown that interactions between children are sometimes clear, and at other times discrete. The assistance of the video camera on occasions helped to better observe what was not otherwise immediately visible.

c) One child observes another child and comments but does not do the same

In this situation, a child would be using his or her own computer and would comment on something that they had just done. The child at the other computer would look over and acknowledge in a verbal manner that he or she had heard and understood the child speaking, then would do nothing more. This occurred a total of six times during the study.

In this example, Adam was using the animal creation program while Steven was using the paint program. Adam was making a strange looking creature with many different body parts.

Steven is mixing colors.
"Red and Yellow make orange!" exclaims Steven.
Adam adds chicken feet to his ox body. Steven mixes red and red and makes red. Adam giggles at his animal. Steven looks at Adam's picture and laughs. Adam has to choose a head for his animal and picks a dog head. Steven stops mixing colors and decides to paint a picture.
(11/5/99)

Here, Steven acknowledges that he has heard Adam by laughing at the picture on the screen, but chooses to continue his work.

d) One child observes another child and comments then does the same

In this situation, a child would be using his or her own computer and would comment on something that they had just done. The child at the other computer would look over and acknowledge in a verbal manner that he or she had heard and understood the child speaking, then would do the same thing on his or her own computer. This occurred a total of 16 times during the course of the study.

In this situation, George and James were at two adjacent computers working together, and were verbally communicating to each another about what they were doing.

> George says to James, "Let's go to the city"
> George clicks on the city scene and James follows.
> George says "try to get this car in the road"
> "How do you change it?" asked James.
> George does it for him and James puts the car in the road in the same place as George.
> "Now let's add a fire truck" says George.
> (10/18/99)

2. Children Commenting and Being Ignored

During the study, sometimes one child would say something to the child at the other computer, but would be completely ignored. This occurred a total of nine times and occurred only while the headphones were not being used.

> Both James and George click on the buttons to add notes to their song. George finds the
> button to play his entire song and says "Hey watch this". James continues to add notes
> then plays his song. Helen comes over and George says "Guys watch this" as he plays his
> song.
> (10/18/99)

Often times children became engrossed with the program they were using and did not realize that someone was speaking to them.

3. Children Sharing or Helping Each Other

Children would sometimes be willing to share the computer with another child or sometimes help out another child at the computer. This occurred a total of 11 times during the study on 6 of the 11 days.

The following observation was recorded and gives an example of how children can effectively use the computer cooperatively. In this example the teacher had just brought out a set of headphones for the children to use. The teacher put on the headphones and plugged them in.

> George hits the button and the teacher smiles acknowledging that she heard the sound. Vanessa comes over to see the headphones. George places the headphones on his ears and hits the button. He laughs as the sound is played. "Wanna hear?" he says to Vanessa? "Yeah!" she responds. He carefully places the earphones on her head and she adjusts them. He clicks the button and she giggles. "Click that one!" she yells, pointing to the cow, not realizing how loud she is. She giggles again as George hits the button. "Now that one!" she yells again pointing to the pig. She laughs harder as George hits the button. She gives the headphones back to George and leaves.
> (11/10/99)

The headphones were used in the classroom for seven school days before being removed. The headphones were removed because it was thought that the children were not interacting as often. This, however, was not the case in the above situation.

Teacher Interactions

During this study, teachers were observed interacting with the children. These interactions included teachers helping the children, teachers solving a conflict, or teachers playing with the children. These occurred a total of 33 times during the study on 10 of the 11 days.

One interaction is as follows:

> Christina moves the mouse around and clicks on the paint program. The teacher says, "Do you want to mix paint colors?". Christina shakes her head and the teacher helps her move the mouse and clicks the icon.
> (10/18/99)

The teachers also sometimes had to intervene when a child's play became too rough or out of control. In one such conflict, Jack had a printout of something he had made and was trying to prevent the other children from using the computer.

> Tracy quits the village scene and opens the city scene. Jack holds his printout in front of Tracy's screen.
> "Stop!" Tracy says.
> "Listen to what Tracy is saying" the teacher tells Jack. Vanessa returns to watch Jessica. Jack moves the printout away from her and puts it in front of Jessica's screen. She looks around it and he moves it away.
> (11/22/99)

The teacher in this case had pointed out the importance of the children listening to each other's needs while on the computer. This encouraged the children to communicate their problems rather than have them be confrontational.

In some instances, children would openly ask for help from the teacher. These were usually cases where the child did not know how to perform a certain task on the computer.   In the following,

> "Amber, can you help me?" Jessica asks the teacher. "I want to use a different program."
> The teacher moves the mouse and clicks the button. Jessica takes over again and begins using the typing program.
> (11/22/99)

The teacher sometimes would sit down and play with the children at the computer.

Conflicts and Conflict Resolution

The children's conflicts were another pattern observed that was recorded. Conflicts were defined as times where children did not agree and verbally expressed their difference in opinion. This occurred a total of 18 times during the study. The conflicts were sometimes resolved by the children themselves, but often needed the intervention of a teacher.

There were only two computers in the classroom and often children were not willing to share the computer. This caused conflict as to who would leave and let the next child have a turn. In this observation Adam wanted to use the computer and neither Christina nor George was willing to leave or share.

> Adam comes over and wants to use the computer. The teacher says to George and
> Christina "Adam wants a turn now, which one of you wants to leave?."
> "She does" George says pointing to Christina.
> They both continue using the computer. Christina pulls out George's headphones from the
> computer
> "What did you do that for?" George yells at Christina.
> "Christina that was not okay" says the teacher.
> George continues clicking on animals.
> "One of you needs to let Adam have a turn" the teacher says again.
> This time Christina points at George to get up.
> The teacher asks Adam "Which computer do you want to use?"
> He points to George's computer and George gets up.
> Adam sits down at the computer George was using and puts the headphones on.
> (11/1/99)

The teacher helped intervene in this situation, but reinforced the idea that the children need to listen to each other and try and work things out on their own. It is interesting that in this particular scenario, the teacher did not encourage the children to work together as a group.

In another situation, a conflict occurred between Adam and Cynthia. This conflict was relatively minor and the children were able to resolve it themselves.

> Adam clicks on his name and enters the animal creation program.
> Cynthia sits down in next to Adam watching him.
> Adam says, "I've got duck feet."
> Cynthia says, "No silly, those are chicken feet!"
> "I think they're duck feet" says Adam.
> "There's no duck in this game" replies Cynthia.
> "Oh yeah" says Adam.
> (10/25/99)

This shows that the children do have the ability to work out conflicts on their own when the situation is presented in a clear manner and they listen to each other.

Individual Children

George

George is a 4 years 5 month old boy who was observed at the computer more than any other child (See Table 1.) He was observed a total of eight times. He was also interviewed.

George was observed several times working with the child at the computer next to him. In the following observation George and James were each at a computer and they decided to mimic one another.

> "Come to this one" George says to James pointing to the animal program.
> James quits the program that was left running and runs the animal program.
> "This is going to be fun" George says.
> James looks at George's screen.
> "Let's make a Rhino" George says.
> James is trying to find the right feet.
> "it's okay I'll wait" says George.
> George then quits and is looking for a name to click on. James does the same. George
> clicks on Destiny's name and James does the same. They both click on the letter game.
> (11/1/99)

George was observed in conflicts with other children. Most often, George was in conflicts with Christina. The teacher did not intervene in any of these situations. The following is one of those conflicts.

> Christina opens the typing program. Christina presses a few buttons and George looks
> over at her screen. George quits but then reopens the paint program.   George reaches
> over and presses some keys on Christina's keyboard. Christina moves her arm to try and
> block him. George keeps trying.
> "STOP!" says Christina.
> George goes back to his computer
> (11/3/99)

When asked about the above situation George responded, " I just wanted to press the keys on

Christina's computer to make it exit."

George enjoyed playing with the animal game. In this game, the child can manipulate parts of

several different animals to create a strange creature. This game was his favorite and when asked why

he said "It's fun to make silly looking animals." George was asked if he enjoyed helping friends at the

computer. He responded by saying "Only when I find something wrong with the computer."   This was

indeed an accurate description of the situation on the two occasions that he did help a friend.

Adam

Adam was another 4 years 5 month old boy who was observed a total of seven times.   Adam

was also interviewed.   Adam was observed using the picture painting program a total of 4 of the 7

times he was observed. Adam said in his interview that this was his favorite program. When asked

why it was his favorite he responded, "It's fun to draw with the computer." The following is an

observation while Adam was using the paint program.

> Adam begins painting a picture (see Figure 1) with purple, black and yellow. He prints out
> his "house picture." Adam says, "I'm making one for you" and prints out another picture.
> The colors on the printout are distorted and he says, "it didn't print out really good."
> (11/22/99)

On three different occasions Adam was observed helping or sharing with his classmates. In this

situation Adam and Cynthia had been working together on an animal. They printed out their picture.

> "Want me to put it in your cubby?" Cynthia asks Adam.
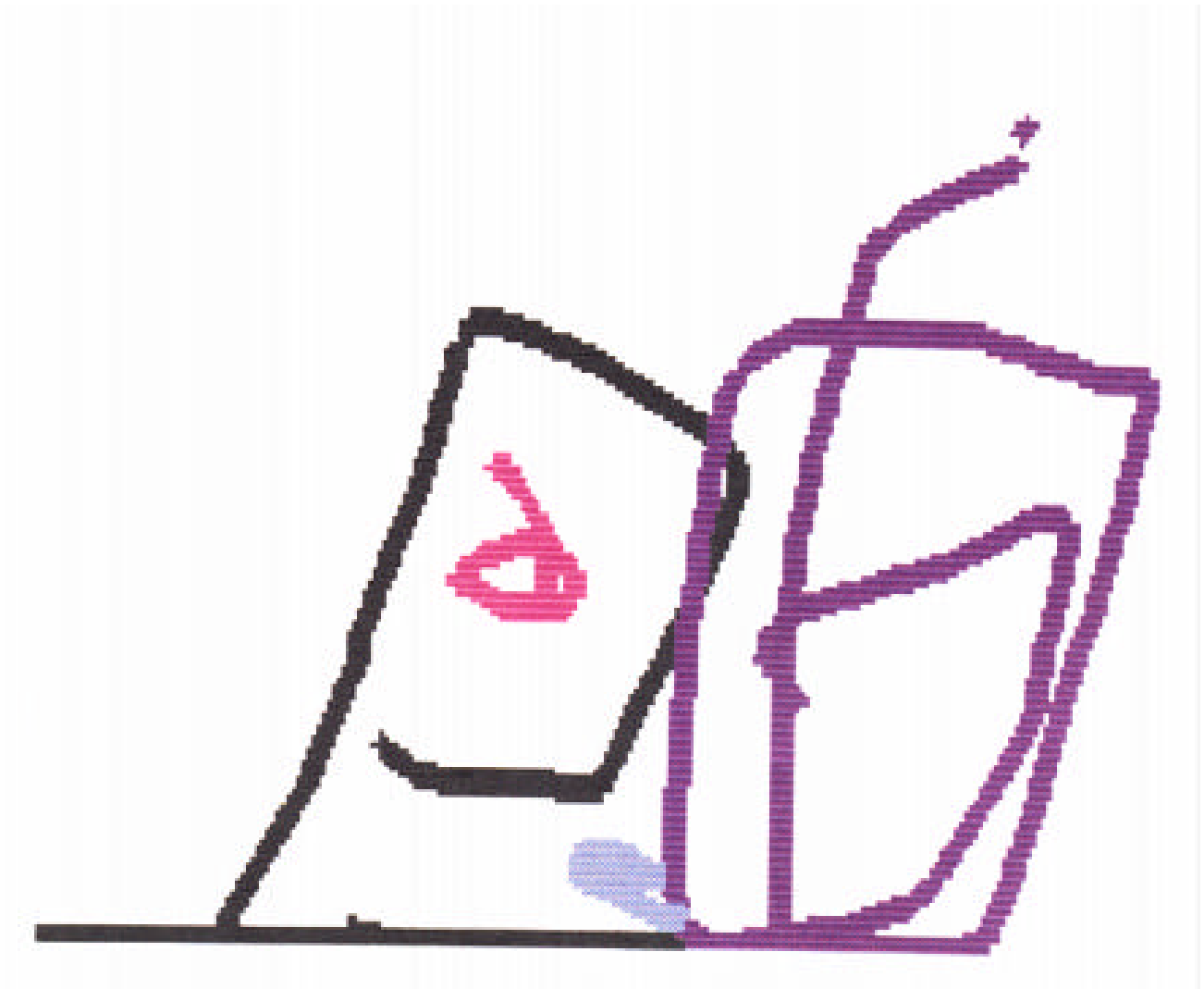> "No thanks, I want to do it" says Adam.
> Adam goes to put the picture in his cubby and Cynthia takes his place.
> (10/25/99)

When asked about helping friends use the computer Adam responded, "Sometimes I help

friends when they don't know how to use the printer."

_____

Insert Figure 1

_____

Figure 1: Adam's House

Christina

Christina was a 3 years 10 month old girl who was observed a total of six times. Christina had been identified as a child with special needs because of her speech difficulties. Christina was observed 5 times using one computer while George was using the one next to it.

The first time Christina used the computer George was willing to help her learn one of the programs. In the following episode, George quit his own program to use the program Christina was using to assist her.

> George watches Christina and quits the face maker program. Christina is having difficulty understanding how to use the mouse. The teacher helps her and adds to paint colors to mix. George says "Watch Christina" and tries to show her how to mix two different colors. Christina clicks and begins drawing a picture. George too clicks and begins drawing a picture.
> (10/18/99)

This was the only time that George and Christina worked together without a conflict. In the following videotaped observation, Christina was making a city and George was using the animal program.

> Christina looks at George's computer and gasps. There are lizard feet on George's screen. George quickly sits up to see what is on his screen. Christina laughs.
> George looks at Christina and says, "It's not funny!"
> Christina laughs some more.
> "No it's not!" yells George.
> Christina continues laughing.
> "I'll tell the teacher" threatens George.
> Christina looks around the room.

Christina was very enthusiastic about using the paint program as well as the city scene creation game. She used these

Steven

Steven was a 3 years 9 month old boy who was observed a total of six times. Steven only attended the childcare on select days. On three occasions Steven wanted to use the computer and was not able to because the other students would not allow Steven to use the computer. In the following observation, Steven wanted to use the computer but George and James did not acknowledge him.

> Steven comes over and says "When is it my turn?"
> George and James seem to intent on their scene to notice him.
> (10/18/99)

After a short time watching George and James, Steven left realizing he would not get to use the computer.

When Steven was able to use the computer he used the painting program quite frequently. He mixed paint colors on every occasion that he used the computer. He would repeatedly mix the same colors. As the study went on Steven was able to correctly predict what the new color he created would be based on the colors he chose to mix.

Discussion and Implications

The purpose of this research was to determine the ways in which children's social behavior is affected by the computer. Specifically, it looked at the interactions of the children with both their peers and their teachers as they worked at the computers.

Discussion

Peer Interactions

In the study of peer interactions, five major patterns evolved. These ranged from comments that were ignored, to glances accompanied by silence or by verbal comments, to cooperative sharing.

Significantly adding meaning to these patterns was the individual personalities of the children. These determined the kinds and the depth of their interactions with each other.

Children were not afraid to ask the teacher or another child for help. More times they did ask the child next to them rather than the teacher but this may have been because the child was closer to them. In the past it has been shown that children are more likely to ask their peer for help rather than the teacher (Clements, 1994; Haugland & Wright, 1997.)

Gender was a critical differentiating factor only from the point of view of frequency of use. In this study each girl used the computer an average of 3.1 times while the boys used it an average of 3.6 times. It has been seen in the past that boys often favor using the computer more than girls (Haugland & Wright, 1997.) In this study, the girls used the computer with other girls and not as frequently with boys. The software on the computer was not gender specific. Within this study, the patterns of interactions between the children could not be related to gender variations. Bergin had found this same result in kindergartners (Bergin, 1993.)

Yelland (1994) found that boys were able to work much faster and more efficiently than girls at the beginning of the study but girls were able to excel ahead of boys over a longer period of time. The short duration of this study prohibited this from being examined. It did not appear, however, that boys or girls used the computer more efficiently over the other.

The software that was used in the classroom was developmentally appropriate. It encouraged participatory learning and provided a holistic learning environment, which are characteristics of DAP software (Haugland & Shade, 1994) A mouse and trackball were used, and as was shown, on child was able to write his name using the computer. This is consistent with an earlier study where DAP software was observed to increase kindergartners' dexterity (Haugland & Wright, 1997) It was

encouraging to see that not only knowledge is gained by using developmentally appropriate software, but also physical motor skills.

Christina was frequently observed using the computer and her speech problem did not hinder her use of the computer in any way. The software did allow Christina to talk about what she had created and she often vocalized what she had done on the computer. Although she had no physical impairments, Christina did find learning to use the mouse difficult. After a period of time though, she became more comfortable and her motions were more fluid. Her speech problem did, however, sometimes lead to conflict. Her words would sometimes be mumbled and children would confuse what she was saying.

Interactions with Teachers

The teachers in this setting played a significant role in helping the children use the computers. Although the teachers in the classroom did not choose the software that was used on the computer, they did recognize the computer's value as a learning tool.

Teachers were able to answer children's technical questions about how to start programs, help children with the motor skills needed to use the mouse, resolve conflicts between children, and also, on occasion, play on the computer with the children.

The teachers often encouraged the children to work together, promoting social interaction. The teachers in the classroom were able to calmly resolve the conflicts observed between children. The teachers would encourage the children to listen to each other's needs. They viewed conflict as an opportunity for guidance and teaching (Stone, 1993)

The teachers in the classroom were able to recognize when individual children needed help at the computer. This was crucial in getting children to gain an initial interest in the computer. Teachers

are sometimes concerned with students not working cooperatively and students not staying on task (King, Barry, & Zehnder, 1996) The teachers in this classroom, however, did not have a problem letting student work cooperatively, rather they encouraged it. Headphones were used for a period of time in the classroom but the teachers quickly realized that the headphones were discouraging the children from interacting with each other and the headphones were removed. Nevertheless, it is pertinent to note that all instances of children ignoring their peer's comments occurred in this study when the headphones were not being used.

The teachers in the classroom also were able to recognize when to intervene and give children help and when to allow the children to discover things on their own. In past studies it has been shown that teacher monitoring can reduce group discussion (King et al., 1996)   Teachers in this classroom recognized this and often let children work on their own. When asked about this, the head teacher in the classroom responded, "Some friends interact well with other friends. Those children I allow to work independently. Other children who don't often interact with friends I try to help them and interact with them."

However, it was interesting to observe Steven repeatedly denied use of the computer by his peers. This was not recognized by the teachers. This constant rejection by his peers may discourage Steven from working with others on the computer, but may also discourage him from using the computer at all.

Limitations to the Study

The results of this study are limited by many factors. One, the study lasted for two months. An extended period would have enabled for more in-depth study of individual children's interactions. Two, the duration of some of the observations was short. This was, however, outside my control because the

children voluntarily chose when and how long they worked at the computer. Thirdly, off computer interactions of these children would have helped to enhance the results and given a more holistic picture of these children's interactions.

Implications

Teacher/Parents

This study carries several serious implications for teachers and parents. First and most importantly, it stresses the value of developmentally appropriate software. Second, it emphasizes the social benefits of peer interactions and therefore calls upon teachers to explicitly facilitate such collaboration among children. Third, particular interactions of individual children indicate that teachers should assess the levels of cooperation exhibited by different pairs of children and then decide on the optimum partnership. Fourth, given the right directions, children are capable of resolving their own conflicts. Teachers and parents should therefore empower children by teaching them appropriate conflict resolution strategies.

Future Research

Future research should explore whether or not children's interactions are a result of individual personalities or just the computer. Further research should also investigate children's interactions off the computer and compare and contrast those with their interactions on the computer to get a more holistic picture of their interactional patterns.

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Appendix A

Letter to Parents
Field Notes
      10/18/99
      11/03/99
      11/05/99
Teacher Interview - Jamie
Child Interview -Adam
Comments by blind reader

Letter to Parents

Dear Parents,

My name is Todd Heft and I am an Honors Student at Eastern Connecticut State University. I am currently working on my Honors Thesis. The purpose of my thesis is to determine how children interact with one another while using different types of software. These observations should help clarify how children work together and socialize while on the computer. The results will help teachers and designers of software optimize the learning benefits for children.

The research study will involve observations of children. These observations will include videotaping and photographing the children while they are on the computer. The children would also be observed while on the playground and asked informal questions on how they feel about the computer. This will pose no risk to your child. I am planning on making observations at Keelor Hall from October to December of 99. With your permission I would like to observe your child approximately 10 times between October and December. These observations will not affect your child's daily routine in any way.

Besides myself, Dr. Sudha Swaminathan (my thesis advisor) of the Education Department and the teachers at Keelor Hall will be the only ones to see these videotaped observations. The information gained during this process and the resulting report would be confidential and your child's name will not appear in any correspondence. All field notes and videotapes will be confidential.

Participation in this study is completely voluntary. If at any point after the beginning of the study you should change your mind, you can withdraw your consent and your confidentiality will still remain intact. Withdrawing would also not prevent your child from further using the computer.

 I would be happy to share my final report with you. In this you will be able to see how your child interacts while at the computer.

We, _____ give Todd Heft permission to observe,
                        Parents' Names

videotape, photograph, and collect work samples of our child, _____ as
                                                                                                Child's Name

part of an Honors Thesis research.

_____ .
                                                                                          Signature

_____ .
                                                                                          Date

Field Notes

10/18/99

1:40

George
James
Helen
Christina
Steven

George comes and sits down at the computer and says "Hey I can't find my name!"
James sits down at the other computer and is having the same problem.
The teacher (Allan) comes over and restarts the program so their names appear
James and George both find their names and click
James clicks on the music maker program
George watches James and he too opens the music maker program.
Both James and George click on the buttons to add notes to their song
George finds the button to play his entire song and says "Hey watch this"
James continues to add notes then plays his song
Helen comes over and George says "Guys watch this" as he plays his song
George then quits his program and James does the same
George starts up the animal maker program
James then starts up the animal maker program.
A pair of lion's legs appear on George's screen
"Yes! Lion's legs!" he says
James's screen comes up with hippo legs
"No!" says James
James hits the button to make his lion's legs too
James chooses the correct head, body and tail to match his lion legs
George is cycling through trying to find the right head
"Man, I missed it!"
He continues to cycle through, now faster
"Oh man! I missed it again!"
Helen watches both George and James intently
James decides to print his lion
George says, "I'm not going to print mine"
James looks intently at the printer
"It's coming" says Helen
George says to Helen, "I'm not going to print mine"
"The lion is printing" says Helen
James roars

"I can see the lion's face!" says Helen

George's lion is walking across the screen as a song plays

"Try to get this song" George says to James

George shows James where to click

Helen turns down the volume on James's computer

"HELEN! Don't do that!" says George

James turns it up just a little.

George quits to make a different animal

James quits the program and goes to the animal scene program

James says to George, "I bet you don't know how to do this"

George ignores him

James adds a lion to his scene and it roars.

"ROAR" say James

George is making a animal consisting of pig's feet, an elephant body, a lion head, and a zebra's tail

James adds a hippo, then a rhino, an elephant, and a zebra to his scene

James clicks to make the animals on the screen move

"look at those" Helen says

James lets Helen click to make the animals move

He then quits and goes to the desert scene

George quits his program and chooses the letter game but quickly quits

James quits his and goes to the letter game

He clicks G and a picture of grass comes up, he clicks F and family comes up

George says to Helen "Watch this!"

Helen ignores George

George clicks on another child's name

James quits his program then searches for the same name

George says "It starts with a D"

George matches up the letters and determines which name it is

James clicks and George says "Give me 5!"

James slaps George's hand

George says to James, "Let's go to the city"

George clicks on the city scene and James follows

George says "try to get this car in the road"

"How do you change it?" asked James

George does it for him and James puts the car in the road in the same place as George

"Now let's add a fire truck" says George

Helen leaves to go home

James adds the fire truck to the scene

"Hey let's add animals" says George

James is attempting to keep pace with George in adding the characters

"add a black cat" says George

Steven comes over and says "When is it my turn?"

George and James seem to intent on their scene to notice him

George says, "I'm putting birds in the sky"

Steven clicks George's computer to exit the program

"DON'T DO THAT STEVEN!!" says George

George then clicks the button on James's computer to exit the program

James says "Let's go to the village"

"okay" says George

George adds animals to his village

"Where are the animals?" says James, but he finds the almost immediately on his own

Steven leaves seeing he is not having an opportunity to use the computers

George adds people to his scene

James is checking the progress of his scene against George's and realizes he is too far behind to add what George has. He begins to add his own things

George sees that James is falling behind and says "Hey let's get out of this" and he quits

James then quits

They both go to the farm scene

George adds chickens, pigs and cows to his scene

James zooms out on his picture

"George you can't do this" says James

George pays no attention and James quits

George adds a rooster and some more chicken to his scene

James opens up the aquarium program

George quits and goes to facemaker

James is designing a fish with different fins

George is making a clown face

Christina is watching from a distance

James finishes his fish and leaves to let Christina have a chance

The teacher comes over to help Christina use the computer for the first time

Christina moves the mouse around and clicks on the paint program

The teacher says, "do you want to mix paint colors"

Christina shakes her head and the teacher helps her move the mouse and click the icon

George watches Christina and quits facemaker

Christina is having difficulty understanding how to use the mouse

The teacher helps her and adds to paint colors to mix

George says "Watch Christina" and tries to show her how to mix two different colors

Christina clicks and begins drawing a picture

George too clicks and begins drawing a picture

Snack is offered and both children leave quickly

 End 2:12

11/3/1999 (Videotaped)

1:41

Christina
George
Steven
James

Christina click on her name
George clicks on his name and then looks at Christina
George clicks on the package icon to open the aquarium game
Christina does the same
Christina's computer loads face maker
George click on the fish store
The fish store opens and George clicks on the bag
Christina quits face maker
"What's this?" Christina asks pointing to someone else's name
Christina clicks on one then laughs, she then taps George and points to the screen
George ignores her
George empties the bag and gasps
Christina opens the flower game
George looks over but continues with his program
George adds things to the bag on the screen
Christina appears confused with her game
George catches some fish and adds them to his bag
Christina clicks on the flower
George quits and watches Christina for a little while
George points to the ladybug on Christina's screen
Christina seems to ignore him
Christina changes the flower and laughs
George opens the animal game
Christina still appears confused with her game
"I want that one" Christina says pointing to George's game
Christina clicks on the ladybug and it traces the petals on the flower she laughs
George is watching his funny animal creation walk across the screen.
George looks over at Christina's computer then begins making a different animal
George cycles through the legs on the program and hits a button
Suddenly, a full lion body appears
"How'd it do that???" George exclaims
Christina looks over at George's computer

George and Christina exchange glances

George then says to Christina "When the legs went like that, (walking across the screen) I pressed that (button on the keyboard) and the lion went walking"

"Push this" Christina says leaning over George and hitting one of his keys

"STOP IT!" George says, attempting to push Christina away

Christina laughs

George stares at Christina

Christina exits her program

"That's it I'm getting out of here" George says to himself quitting his program

"Bye-bye" George says, he then begins spinning the mouse ball

Christina swats her hand at the screen and laughs

George glances over

"I want that" Christina says pointing to one of the icons

George resumes looking at his computer

Christina loads the city scene

George loads the animal game then quits, then loads it again

Christina begins adding objets to her city

George quits the game again then slams his hand on the mouse

He then loads the game once more

He then leans way over on the chair and is looking at Christina's city

Christina looks at George's computer and gasps

There are lizard feet on the screen

George quickly sits up to see what is on his screen

Christina laughs

George looks at Christina and says "It's not funny!"

Christina laughs some more

"No it's not!" yells George

Christina continues laughing

"I'll tell the teacher" threatens George

Christina looks around the room

George continues playing with his game

Christina then continues to add items to her city scene

George continues making his funny animal

George then changes the screen and some words appear

He then exits this view and quits the animal game

Christina is adding some cars to her scene

Steven comes over and says "When can I have a turn?"

George turns around and so does Christina

They don't verbally answer his question, but turn around and continue using the computers

Steven leaves

George opens the animal program again

Christina is pressing buttons on her computer

George is dancing in his seat to the music the computer is playing

Christina is becoming bored with the game and does not know how to exit
She is moving the mouse around
George is making another funny animal
Christina then quits and opens up a different scene
Steven returns and is watching George make animals
Christina is adding animals to her farm scene
Steven watches for a few seconds then leaves again
George does something he is not happy with and slaps his forehead and says "Stupid computer"
Christina exits her scene
James walks by and watches what George and Christina are doing
Christina clicks on a different name and laughs
George begins pounding on his keyboard
Christina quits
James leaves
Christina then clicks on her name
George quits his game and opens the paint program
Christina opens the typing program
Christina presses a few buttons and George looks over at her screen
George quits but then reopens the paint program
George reaches over and presses some keys on Christina's screen
Christina moves her arm to try and block him
George keeps trying
"STOP!" says Christina
George goes back to his computer
Christina is pressing buttons on her computer
George begins to draw a picture on his screen
Christina quits her program
George is slamming his hand against the mouse to move it
Christina laughs
Christina then tries to put her hand on the mouse to stop George
"HEY!" yells George
Christina goes back to her computer and George continues to slam the mouse
James comes back over to watch
Christina quits
George switches colors and continues his painting
Christina clicks on her name then clicks on the keyboard
George has switched colors and his screen is filling up with his drawing, he is no longer slamming the mouse
Christina quits the game
George walks over to print his drawing
The printer gets turned on and Christina tries to touch the printer
"Don't to that Christina!" Yells George
George's picture begins printing

Christina opens the shape painting program

She fills in the background with blue

She points to the circle and mumbles "Circle"

George gasps

"Christina said 'sucker'" George says

"No she didn't, she said 'Circle'" I reply

"SUCKER" says George

"Nah ah" says George "You don't know anything"

George stares at Christina

Christina laughs and adds shapes to her screen

George watches her intently

George is still insistent

"Ann, Christina said 'sucker'" George says to the teacher

"What George?" asks the teacher?

"Christina said 'sucker'" George says to the teacher again

"Did you tell her you don't like that?" the teacher asks George

"I don't like that" George says to Christina

"Maybe she meant a lollipop" the teacher says

"No, she said 'sucker'" George says

"Come here George" says the teacher in an inviting and friendly tone

She then tries to gently pull George but he resists

"I have a secret George" the teacher says

"Me, me, me!!" says Christina running to the teacher

George pulls on Christina's shirt to try and stop her

James follows Christina

"URHHH!" Yells George

He then grabs his printout

Christina returns

"What is it?" George asks her

He smiles as he looks at the teacher

Christina sits back down at her computer while George goes to talk to the teacher

She leans over and presses the mouse button on George's computer

She laughs and returns to her game

George comes back over to his computer

George quits his program

The printer is printing George's picture again

George hands it to me

George then leaves the computer

James takes George's place

Christina is laughing

James clicks on the story program

James exits the program

Christina quits her program

James clicks on Destiny's name

James opens the story program again he looks at Christina's computer

Christina clicks on her name

James presses the button for "In"

The computer repeats the word several times

Christina opens the music maker program

James presses on "Y" and the computer says "Yellow"

Christina quits the program

James presses "N" and nine items come up on the screen

Christina opens another program

James quickly cycles through several letters, he stops on "F" for family

He then cycles through several more letters again

Christina again does not seem to know what to do and leaves

James's computer is repeating "Jump"

James then leaves and Caitlin sits where Christina was, then leaves and sits where James was sitting.

2:30

11/5/99

1:43
Steven
Adam

Steven begins by finding his name and clicking on it
He then opens the painting program
Adam intently searches for his name and clicks on it
Adam opens the animal program and decides to create his own animal
Steven is mixing colors
Red and Yellow make orange!
Adam adds chicken feet to his ox body
Steven mixes red and red and makes red
Adam giggles at his animal
Steven looks at Adam's picture and laughs
Adam has to choose a head for his animal and picks a dog head
Steven stops mixing colors and decides to paint a picture.
He moves the mouse around making red lines on the screen
Adam now adds a pig tail to his creature and it walks across the screen
Steven changes colors and makes blue lines over his red ones
The teacher comes over and asks Steven if he can add shapes to his picture
Steven clicks on the button with a square on it then click on the screen. A blue square appears
he adds more squares and makes a wall
Adam sees the "wall" and decides to make one of his own
He exits his program and searches for the painting program.
He clicks on it and adds black circles to the screen.
Steven sees Adam's circles and begins adding circles of his own
After filling his screen with circles and squares Steven decides to print his picture
He clicks on the print button and the printing begins to print
Adam looks on with curiosity and decides he wants to print too
He clicks print but there is an error
He becomes frustrated and the teacher says "Adam you have to wait until Steven is done printing his picture"
Steven gets his picture when it is finished and leaves
Adam begins printing his and watches intently as it comes out
He grabs it and runs to show the teacher
2:03

Teacher Interview - Jamie

1. How are children encouraged to use the computer?

"I try to get the kids to use the computer at group times. I try to have children who don't normally use the computer use it or children who need a quiet activity."

2. Are children encouraged to work together at the computer?

"Children are encouraged to work together if both computers are already in use. Sometimes we'll hang up pictures that they have created together on the computer. They particularly seem to enjoy working together when using the cityscape game."

3. How the children react when you are helping them on the computer?

"Most of the children openly ask for help but a few want no help at all. It seems to depend on the child"

4. Do the children openly ask for your help while on the computer?

"Yes"

5. Do you help the children and interact with them on a regular basis or do they work independently?

"Some friends interact well with other friends. Those children I allow to work independently. Other children who don't often interact with friends I try to help them and interact with them."

6. Do the children with special needs use the computer as often as those without special needs? "I would say it would be the same. It is interesting that the children who don't have computers at home use the computer more often here, while those who do have a computer don't use this one very often."

7. Do the children resolve conflicts themselves when on the computer or is teacher intervention often needed?

"With this age group it seems that teacher needs to often intervene to help solve the conflict."

8. How is the computer hardware and software chosen?

"The hardware and software was chosen prior to me working here. I believe it was selected by June Wright."

Child Interview - Adam

What is your favorite thing to do on the computer?
    I like making pictures.

Why?
    It's fun to draw with the computer.

Do you like when a friend helps you with the computer?
    When I need help sometime I ask a friend if they're not busy, other times I ask a teacher.

Do you like helping friends with the computer?
    Sometimes I help friends when they don't know how to use the printer

Comments by blind reader

A third person who was blind to the study was asked to read the following excerpts from the

field notes and view the videotape of 11/3/199 and give his insight as to what was happening.

> James sits down at the other computer
> "Come to this one" George says to James pointing to the animal program
> James quits the program that was left running and runs the animal program
> "This is going to be fun" George says
> James looks at George's screen
> "Let's make a Rhino" George says
> James is trying to find the right feet
> "it's ok I'll wait" says George
> They finish their animals and the animals walk across the screen
> James then begins making another animal with zebra feet
> George follows
> James then ads a camel body, a deer head and a polar bear tail
> George looks carefully at James's animal and does the same
> their animal walk across the screen
> George then quits and is looking for a name to click on
> James does the same
> George clicks on Destiny's name and James does the same
> they both click on the letter game

The following is his response:

"It appears as if George and James are close friends. They seem to work very well together.

These two children seem to work very positively at the computer. The helping and waiting that George

does says that he is concerned about working as a team."

This observation was also read by the same person

> Christina is having difficulty understanding how to use the mouse
> The teacher helps her and adds to paint colors to mix
> George says "Watch Christina" and trys to show her how to mix two different colors
> Christina clicks and begins drawing a picture
> George too clicks and begins drawing a picture
> Snack is offered and both children leave quickly

In response,

"It again appears that George is child who is concerned with what his peers around him are doing. This is definitely a positive sign that children can enjoy computers together."

The third party was then shown the videotaped observation of 11/3/99.

"This tape is very different from the other two interactions. George appears to be much more out of control and violent. The interactions between the teacher and the children were very good. She was able to recognize a conflict and attempted to solve it in a calm manner. It was also strange to see two children completely ignore a third when he asked to use the computer. I'm surprised that the children's time at the computer isn't more regulated."