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Utilizing the classroom computer in a special education setting to facilitate cooperative learning: a case study using KidPix

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Collaboration and cooperative teaching methods have been researched since the late 70's. The research indicates students will learn from each other given the proper environment and tools. In this study, six elementary students were evaluated to examine the effects of teaching individual tasks to students and observing the students for collaboration between partners. Two students were placed side-by-side at one computer and observed by an undergraduate researcher.

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UTILIZING THE CLASSROOM COMPUTER IN A SPECIAL EDUCATION

SETTING TO FACILITATE COOPERATIVE LEARNING:

A CASE STUDY USING KIDPIX

A Graduate Research Paper

Submitted to the Division of Education

Department of Curriculum and Instruction

in Partial Fulfillment

of the Requirements for the Degree

Master of Arts

UNIVERSITY OF NORTHERN IOWA

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Audrey Dieken

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This Research Paper by: Audrey Dieken
Titled: Utilizing the classroom computer in a special education setting to facilitate cooperative learning: A case study using KidPix

Has been approved as meeting the research requirement for the
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Finally, I want to let my parents, Levi and his family, know that it means a lot to me that they supported my education.

Abstract

Collaboration and cooperative teaching methods have been researched since the late 70's. The research indicates students will learn from each other given the proper environment and tools. In this study, six elementary students were evaluated to examine the effects of teaching individual tasks to students and observing the students for collaboration between partners. Two students were placed side-by-side at one computer and observed by an undergraduate researcher. The results of the observations report the students were engaged in the activity of *KidPix* 60-100% of the time. All of the students were able to complete the tasks over 95% of the time at the follow-up visit. The classroom teacher did allow the students to work on the *KidPix* program at anytime throughout the study. However, the teacher was not familiar with the program, therefore the students learned from their own experience or through each other.

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Introduction

Introduction to the Problem

The nature of this research entailed the use of a computer-rich, collaborative learning environment in a special needs classroom setting. The purpose of the study was to investigate the collaborative learning behaviors of elementary aged students with special needs when working on the computer.

Statement of the Problem

After reviewing the literature on cooperative learning, the majority of cooperative learning is structured around group task. Much of the past research has focused on a traditional classroom environment. However, it has been noted that success with microcomputers can be carried over from the traditional classroom to benefit all learners.

This study investigates cooperative learning in a special needs environment when working on the *KidPix* computer program. Each student had access to computers with *KidPix* after they were taught a specific skill. The objective was to observe each student as they interacted with the software and each other as they learned *KidPix*. The observers recorded the types of interactions among the students while they worked on the computers. Student interactions changed from simple to complex over time and their exploration behaviors changed with time as well.

Review

History of Collaboration and Cooperative Teaching Methods

Since the late 70's through today, educators have examined ideas behind collaborative and cooperative teaching styles. Many general ideas related to both teaching styles are still widely used throughout traditional and non-traditional classrooms for small group instruction. Even so, Carrier & Jonassen (cited in Hooper, 1992) reminded us computer technology has been the ideal medium for individualized instruction because of the computer's ability to vary presentation modes and alter instructional decisions based upon the individual student's performance, instructional level, and need. Despite individualized need, Hooper (1992) stated students most often work together in small groups at the computer. Becker (cited in Hooper, 1992) reported students were assigned to groups to collaborate on a computer assignment 66% of the time. Plus, classrooms frequently only have one computer. Therefore, logistical computer problems in the classrooms enhanced the idea of collaborative learning.

Friend and Cook (cited in Stanovich, 1996) developed a list of six key characteristics of successful collaboration. Collaboration is a voluntary method of teaching and learning and requires parity among all participants. It should be based upon mutual goals and shared responsibility for participation and decision making. The individuals who collaborate share resources and accountability for the outcomes of the project, class, or event.

Cooperative learning is another small group learning method researched for its benefits. Hooper (1992) distinguished this learning style by comparing quality of student interaction to the learning activity. Slavin (cited in Hooper, 1992) developed four

categories of cooperative learning: behavior, incentive structure, task structure, and motive. He stated, "cooperative learning involves small groups of students who incorporate a cooperative task structure, a cooperative incentive structure, and a cooperative motive to produce a cooperative behavior" (p. 23-24).

History of Microcomputers in Special Needs Classroom

Many changes have taken place in the advancement of communication technology and technology resources for use in classrooms. Development of special tools and programs with text, video, and audio recognition allow for endless possibilities in a special need's classroom environment (Vanderbilt Learning Technology Center, 1993).

Research has focused on mainstreaming students with special needs by integrating microcomputers into school activities. As Gresham (cited in Spiegel-McGill, Zippiroli, Mistrett, 1989) concluded, failure to mainstream students with special needs was generally due to their lack of social skills and acceptance by non disabled peers. Gresham also noted mainstreaming alone might not support the opportunity for students with special needs to acquire or improve their social skills. Environmental and instructional modifications and/or adaptations were necessary for success. Therefore, McCormick (cited in Spiegel-McGill, Zippiroli, Mistrett, 1989) stated "microcomputers have the potential to facilitate social interaction among preschoolers who are handicapped and non-handicapped by providing such opportunities" (p. 249).

Instructional Strategies

There are many factors to taken into consideration when preparing for classroom instruction. Young, West, and Macfarlane (1994) defined six key items to evaluate prior to determining how the lesson will be presented to the students. These included whether

to teach individually or with other learners present, how much practice should be available for the skill being taught, whether it is a new skill or not, the environment or setting, who will teach the lesson, and what materials should be used. The researchers suggested development of instruction be completed by taking all the factors into consideration.

The first key factor of whether to teach individually or to use group instruction can be very difficult in any environment including the special needs classroom. The authors point out many advantages to teaching groups of students. Groups can facilitate a natural occurring conversation leading to group instruction or a learning environment simulating a future work environment. Young, et al (1994) believed there is a time and a place for both group and individual instruction and state:

> In a group, there are opportunities for learners to observe one another's behavior and learn from others' successes and/or mistakes. A more advanced learner who needs practice can serve as a model for a less-skilled learner. However, if a learner is easily distracted by a peer, then one-on-one instruction may be more appropriate. When utilizing group instruction, the primary concern is to keep all learners actively engaged in the learning process by providing frequent opportunities to respond. (p. 54)

Hooper (1992) also supported small-group learning. He believed cooperative learning is advantageous to learners. Hooper supported Damon & Phelps evaluation on small-group learning. Damon & Phelps (cited in Hooper, 1992) believed two key factors played into small-group learning philosophy; equality and mutuality. Equality is described in terms as the equality of the group members. If the group members are more equal, the flow of

information will be more bilateral. Mutuality referred to the degree of engagement between group members. If mutuality is high, there are more interactions between students.

Mutuality and equality are key factors to cooperative learning. Cooperative learning takes place so a small group of students can work together to study and master unfamiliar topics. Hooper (1992) outlined four essential methods involved for this teaching strategy. These included cooperative behavior, task structure, incentive structure, and group motivation. Johnson, Johnson, & Holubec (cited in Hooper, 1992) believe"...cooperative behavior is facilitated by positive interdependence" (p. 24). This statement supported Hooper's theory that cooperative behavior increases mutuality. However, Hooper also believed group achievement is directly related to group task, incentives, and motivation.

In reviewing the literature on cooperative learning, the majority of cooperative learning activities are structured around a group task. The learners work together to achieve a common goal. Hooper (1992) reported this could be accomplished in one of two ways. The task can be a collaborative effort where everyone learns the complete set of tasks or each student is responsible for learning one task and teaching it to the other students. Either method requires the students to be interdependent upon one another for accomplishing the task. In any event, the cooperative learning method is not very successful unless there is an incentive structure directly related to the learning.

Slavin (cited in Hooper, 1992) stated "... incentive structure may be classified as cooperative, individual, or competitive" (p. 24). The incentive structure can be directly tied to the learning or the achievements of each learner can be unrelated. Regardless of

the incentive structure, it is still important for the motivation to exist for the success of the cooperative learning. Hooper (1992) defined group motivation as "... the tendency of individual group members to behave cooperatively within a group environment" (p. 25). Setting all the other factors aside, it is still important for the group members to work together in the learning environment. Latane, Williams, & Harkins (cited in Hooper, 1992) reported the social philosophy behind the principles of cooperation. They felt the individual will be more willing to contribute to the process if the other group members perceive their contribution to the project as valuable. However, it is also important for the other group members to produce effort to the project to achieve overall success.

Microcomputers as Facilitators in Collaborative/Cooperative Environment

In reviewing the literature, there are many factors involved with the ideas behind the use of computers to enhance the collaborative/cooperative learning environment. Research by Clements, Nastasi, & Swaminathan (cited in Kinsley & Langone, 1995) revealed there were high levels of spoken communication and cooperation as young children interacted on the computer as compared to traditional learning activities in the classroom. Muller & Perlmutter (cited in Howard, Greyrose, Kehr, Espinosa, and Beckwith, 1996) research reported"...young children engaged in significantly more social interaction (e.g., spontaneously sharing and instructing each other, verbally and non-verbally) when they were involved with learning games at a computer" (p. 37). In addition, Johnson & Johnson (cited in Dalton, Hannafin & Hooper, 1989) reported cooperative computer-assisted instruction has been effective in many areas including social skills, creative thinking and academic performance.

For students with special needs, the learning environment is unique because each situation differs according to the disability and past learning experiences of the student(s). However, it is noted success with microcomputers can be carried over from the traditional classroom to benefit all learners. Smaldino, Schloss, Goldsmith, & Selinger (1983) completed an extensive study of hard-of-hearing students compared to normal-hearing youth on a specific learning task. They reported problems many teachers face with the presentation of materials to hard-of-hearing youth. They concluded the use of microcomputers in the classroom provided an efficient approach to teaching new concepts while allowing students repeated exposure to information. Also, "...microcomputers may provide a streamlined feedback channel to ensure the learner's progress" (p. 644).

A controversy exists over whether students with special needs should work among one another or with more typically-developed peers in an integrated group. Spiegel-McGill, Zippiroli, & Mistrett (1989) reported children with disabilities demonstrated more socially-directed behaviors when interacting on the computer with more typically developed peers. Also, children with disabilities interacted more frequently when involved in computer activities versus non-computer activities. However, a study by Fazio & Rieth (cited in Kinsley & Langone, 1995) reported on peer interaction between higher and lower-functioning preschoolers with disabilities. After 30 weeks of observation, it was noted children who were considered lower-functioning were never observed in the classroom without some form of assistance. Further, their choice for peer assistance versus adult aid increased over time. Whereas, the children considered

higher-functioning worked independently in the classroom 62% of the time in the last

five weeks of the study.

Howard, Greyrose, Kehr, Espinosa & Beckwith (1996) repeated a study on how

microcomputers affect young children with disabilities. They also reported significant

differences in childrens' behaviors when the computer was involved.

> ... both the toddlers and the preschoolers demonstrated more active
>
> waiting, less solitary play, more turn-taking, more attention to
>
> communication, and more positive affect (e.g., smiles, laughter, screams of
>
> delight, invitational gestures, positive vocalizations) during small-group computer
>
> activities than they did when engaged in small-group activities that did not
>
> involve the computer. (p. 43)

Spiegel-McGill, Zippiroli & Mistrett (1989) believed children with less social

competence relied more heavily on the computer, and accompanying software, to sustain

interactions with more socially competent peers.

Conclusions and Recommendations

In conclusion, it appears that the use of microcomputers along with collaboration

and cooperative learning methods have been successful in the special needs environment

based upon the current research. They have identified key issues that need to be

addressed when incorporating computers into the classroom to enhance social skills for

the special needs students.

However, it is important to note that most of the studies have been based upon

small groups with similar special needs in each area. Also the variety of software titles

has been limited and technology is continually making advancements, creating the need

for further research with improved technology. More research needs to take place on how to evaluate software for its educational value as well to improve the validity of the studies.

This study examined the effects of pairing students at the computer to determine if cooperative behavior would take place after each student had learned one component of the *KidPix* program. Data supporting the acquisition of the skills necessary to use *KidPix* was also obtained.

Method

Participants

Six elementary students (aged 10 and 11) participated in the study. Three were female; three were male. Two students were African-American and four students were Euro-American. The students were all classified as having moderate or severe disabilities. Specifically, all students had some level of mental retardation. Some students also exhibited secondary conditions such as fine motor deficits and/or behavior problems. All student names used throughout the article are pseudonyms.

Setting

Overall, the classroom had an open floor plan with the computers intermixed with the traditional classroom environment. A cooking/eating area, classroom discussion area with tables, desks, and chairs and an entertainment/relaxation area were all a part of the classroom design.

The study took place in a self-contained classroom (i.e., Level III) in an elementary school (grades K-5) located in a mid-sized Midwestern city. Seven students were in the classroom, however only six students participated in the study. Four

computers were eventually placed in the classroom. Two Macintosh II cx computers, along with the appropriate peripherals (e.g. mouse, keyboard, monitor, hard drive) and two color printers were donated from the university. Two Macintosh computers were placed in the classroom by the school system. *KidPix* (KidPix, 1996) was installed on three of the four computers. One of the classroom computers, an older model, did not meet the system requirements.

As frequently happens in classrooms with more students than computers, students often sit passively and observe someone else play a game. Occasionally, computer programs facilitate more than one participant. Computer time and computer access was a requent free time choice.

The computers were placed throughout the classroom. One computer was placed behind a divider in a work area next to the cooking/eating area. The divider allowed for some privacy or individualized work on the computer. Students did work together at this computer as well. The other three computers were on the other side of the room. Two computers were placed side-by-side next to the classroom discussion area and had *KidPix* installed. Students could work individually, side-by-side, or in a small group cooperatively. The last computer was placed near the television area. This computer did not have *KidPix* installed.

Software

The software program used was an interactive tool that has a variety of six different types of multimedia tools. *KidPix* can be used as a presentation tool, a drawing program, to create movies with original sound, and other limitless ideas for the younger learner. This program was designed by Broderlund software which is now a part of the

Learning Company. The program is designed to allow a large age range to comfortably work with the tool. Many students have reported that they started working with the program before the age of six. The program is versatile and visual, allowing for understanding by younger users.

Observers/Trainers

The observers/trainers for the study were four undergraduate students, all majoring in Mental Disabilities: Moderate/Severe/Profound at a Midwestern university focusing on teacher education. One student was classified a junior and the other three were in their semester prior to student teaching. All four students had at least 100 hours previous field-based experience working with students with disabilities. All the students were volunteers for the project.

Research was conducted under the auspices of the College of Education through an Undergraduate Experiential Learning Grant. One graduate student was recruited to manage the process and analyze the data. A professor from the Department of Special Education was selected to oversee the entire project.

Procedures

Stage 1 – Pre-study. The first step involved having the observers/trainers become proficient with the *KidPix* software program. Each took home a laptop computer for a couple of days and worked with the drawing portion of the software until each could complete the basic tasks that would later be assigned to the participants. Each trainer also went to the classroom to observe the participants and teacher within their classroom environment. Trainers gained the knowledge of the student's disabilities and learning skills.

Prior to the initial observations, a lab technician from the university went out to assess the classroom computers. The donated computers were set up and *KidPix* was loaded on each viable computer.

After one week of preparation, the trainers met as a group to identify what skills should be taught to the participating students. It was determined each student would have a certain set of skills regardless of what aspect of the *KidPix* portion of the program was targeted. Therefore, the trainers developed a training tool to show the students how to start the program, open *KidPix*, save a document, and print a document. Then, a task analysis was developed for each skill within the program that would be taught to the students and what determined proficiency. See Appendix A for selected task analyses.

Stage 2 – Training. The trainers then went to the classroom separately to work with their assigned students. Training time was determined by how long it took the student to master their assigned skill. Mastery was determined when the student achieved the steps on the task analysis independently.

A schedule was developed and the observers were assigned times that coincided with the teacher's schedule. This schedule also included regular meetings to discuss issues about the study.

Stage 3 – Observations. An observation form (see Appendix B) was developed. Initially, five minutes of 1-minute interval data was collected. Next, the observers recorded field notes for 20 minutes. Finally, the observers collected an additional five minutes of 1-minute interval data. Thus, the observation period lasted a total of 30 minutes and involved a combination of quantitative and qualitative data.

While collecting the qualitative data, observers subjectively determined whether or not the student spent most of the interval occupied in one of the four possible level of engagement. The four levels were engaged, passive, off task, and problem behavior. The definitions for each of the categories were listed on the data collection instrument (see Appendix B). A reliability check was done by having two observers complete observations at the same time. Also, a video tape recording was made of one of the observation sessions.

Stage 4 – Follow-up. After a 3 week time period in which no observers were in the classroom, a follow-up session was arranged. The four primary participants were evaluated individually at one workstation. The evaluation determined the student's current skill level and retention of the *KidPix* tasks. Each student was asked to perform the targeted tasks.

After the final evaluations, the undergraduate and graduate students held a celebration for all the students, teachers, and associates in the classroom. During this time, everyone shared his or her thoughts and ideas on the project.

Results

Table 1 reports the percentage rates on the four levels of engagement observed during the study. Most of the observations that included Daniel have a pattern of passive, off task, and problem behavior time. He was never able to stay engaged with the program for the length of the observation. The other participating male student, Curt, also had a difficult time staying engaged. Although Curt had a tendency to be more passive than anything else.

Table 1. Results of 5-minute interval observations.

Observation #	Student	Target Skill	E	P	O	PB	Observer	Date
1a	Larinda	paintbrush	80		20		*Tammy/Christine	4/10/2000
	Daniel	line,eraser,pencil	40	60			Tammy/Christine	4/10/2000
1b	Larinda	paintbrush	100				Tammy/Christine	4/10/2000
	Daniel	line,eraser,pencil	100				Tammy/Christine	4/10/2000
2a	Jamie	stamp	100				Annie	4/10/2000
	Curt	paintcan,mixer	100				Annie	4/10/2000
2b	Jamie	stamp	100				Annie	4/10/2000
	Curt	paintcan,mixer	60	20	20		Annie	4/10/2000
3a	Jamie	stamp	100				*Tammy/Christine	4/12/2000
	Daniel	line,eraser,pencil		100			Tammy/Christine	4/12/2000
3b	Jamie	stamp	80		20		Tammy/Christine	4/12/2000
	Daniel	line,eraser,pencil	80		20		Tammy/Christine	4/12/2000
4a	Larinda	paintbrush	100				Bob	4/13/2000
	Curt	paintcan,mixer	80	20			Bob	4/13/2000
4b	Larinda	paintbrush	100				Bob	4/13/2000
	Curt	paintcan,mixer	20	80			Bob	4/13/2000
5a	Jamie	stamp	60			40	Tammy	4/14/2000
	Larinda	paintbrush	100				Tammy	4/14/2000
5b	Jamie	stamp	20			80	Tammy	4/14/2000
	Larinda	paintbrush	60	20		20	Tammy	4/14/2000
6a	Jamie	stamp	100				Tammy	4/19/2000
	Daniel	line,eraser,pencil	40		60		Tammy	4/19/2000
6b	Jamie	stamp	100				Tammy	4/19/2000
	Daniel	line,eraser,pencil		40		60	Tammy	4/19/2000
7a	Larinda	paintbrush	80	20			Annie	4/19/2000
	Alice	not targeted	100				Annie	4/19/2000
7b	Larinda	paintbrush	100				Annie	4/19/2000
	Alice	not targeted	20	40	20	20	Annie	4/19/2000
8a	Hannah	not targeted	100				Bob	4/20/2000
	**Curt/Alice	paintcan,mixer	100				Bob	4/20/2000
8b	Hannah	not targeted	100				Bob	4/20/2000
	**Alice	not targeted	100				Bob	4/20/2000
9a	Jamie	stamp	40	60			Tammy	4/26/2000
	Daniel	line,eraser,pencil	60	40			Tammy	4/26/2000
9b	Jamie	stamp	60	40			Tammy	4/26/2000
	Daniel	line,eraser,pencil	60		40		Tammy	4/26/2000
10a	***Jamie	stamp	100				Tammy	4/28/2000
	Larinda	paintbrush	100				Tammy	4/28/2000
10b	Jamie	stamp	100				Tammy	4/28/2000
	Larinda	paintbrush	100				Tammy	4/28/2000

*Observation notes collected together

** Students switched because one walked away from computer

*** Two computers side-by-side, each student at a computer

The female students were more successful when judged by the levels of engagement. However, the girls were not consistent when placed together. It appears the girls stayed 100 percent engaged when paired with a male partner, but engaged in some problem behavior when paired together.

Even so, the final evaluation (see Table 2) documented 91% of the tasks could be completed by all participants. A complete set of field notes was documented on each student.

Jamie

Jamie was observed on six occasions plus the follow-up observation. In general Jamie was relatively proficient with *KidPix*. She was interested in controlling the mouse, however she seemed very concerned her partners also learn the program. Jamie was willing to teach, but she was not a very good student to the other participants. Most of the time she did not mind sharing, but she was aware of when it should be her turn. Jamie also demanded the mouse when she noticed her co-participants stumbling so she could assist them with the answer.

Jamie was involved in the observation that included two side-by-side computers. She was working with advanced features of *KidPix* throughout this observation. Unfortunately she was not willing to verbally share with her partner until the end of the session. However, Jamie did allow her partner to watch her complete tasks without verbal communication throughout the session.

Larinda

Larinda was observed on five occasions plus the follow-up observation. In general Larinda was relatively proficient with *KidPix*. She was interested in exploring the

Table 2. Results of the followup session.

Opening the Program

	Curt	Daniel	Larinda	Jamie
Clicks on hard drive	C	C	C	C
Clicks on Kid Pix Folder	C	C	C	C
Clicks on Kid Pix icon	C	C	C	C

Getting New Document

Clicks on file	C	C	C	C
Drags to new	C	C	C	C

Save a Picture

Clicks on file	C	C	C	C
Drags to save	C	C	C	C
Titles document	C	C	C	C
Clicks on save	C	C	C	C

Paint Can

Selects paint can icon	C	C	C	C
Choose color	C	C	C	C
Fills color	C	C	C	C
Chooses pattern	C	C	C	C
Fills pattern	C	C	C	C

Mixer

Selects mixer icon	C	I	C	I
Chooses pattern	C	I	C	I
Fills pattern	C	I	C	I

Stamp

Selects stamp icon	C	C	C	C
Chooses stamp from tool bar	C	C	C	C
Change stamp selection	C	C	C	C
Place stamp on picture	C	C	C	C
Enlarges stamp size	C	C	C	C
Reduces stamp size	C	C	C	C

Wacky Pencil

Selects pencil icon	C	C	C	C
Changes shape of line	C	C	C	C
Changes thickness of line	C	C	C	C
Changes pattern of line	C	C	C	C
Draws with pencil	C	C	C	C

Line

Selects line icon	C	C	C	I
Changes thickness of line	C	C	C	I
Changes pattern of line	C	C	C	C
Draws a line	C	C	C	C

Wacky Eraser

Selects eraser icon	C	C	C	C
Selects type of eraser	C	C	C	C
Activates the eraser	C	C	C	C

Paintbrush

Selects paintbrush icon	C	I	C	C
Clicks arrow	C	I	C	C
Chooses option	C	I	C	C
Draws line	C	I	C	C
Changes task bar options	C	I	C	C
Changes colors	C	I	C	C
Makes multicolored pictures	I	I	C	C

C = Correct
I = Incorrect

software in detail. Her need for exploration caused problems because Larinda was not very good at sharing. She would lose interest when her partner had control and she would either get off-task or start an argument of some type with her partner.

Larinda was involved in the observation that included two computers side-by-side. Larinda was able to work better when she had her own computer with a partner next to her to compare computer screens. She was able to watch her partner work on the other computer and then explore those same functions on her own computer. Larinda was generally successful in completing the same tasks.

Daniel

Daniel was observed on four occasions plus the follow-up observation. In general Daniel was an average level user of *KidPix*. Daniel had worked with the program in the past and was not willing to explore new features. Daniel would work with the portions of the software he was comfortable with, but he was generally off-task throughout the observations. Daniel was always more interested in the classroom activities than working on the computer.

Curt

Curt was observed on three occasions plus the follow-up observation. In general Curt was proficient with *KidPix*. Curt was not interested in working directly with his partners. He only stayed on-task when he had control of the mouse. Curt was always willing to share information with his peers, however he preferred to do this by example rather than verbal communication. Curt would only spend a short time at the computer during his observations and then leave the work area when he was done with his task. He appeared to be happier and more focused when he was alone at the computer.

Discussion

Conclusions

Kidpix proved to be an appropriate piece of software to use with students with moderate levels of disabilities. Originally designed for typically developing children for ages 3 and up, the results of this study clearly support the appropriateness of this software for use with children who have significant disabilities. Children with moderate/severe disabilities can be taught to use software in ways it was designed to be used by non-disabled peers.

On another note: this project also vicariously examined the ability of pre-service or undergraduate students to conduct action research with guidance. Students were able to organize and carry out this research project. While not as sophisticated or technically rigid, their success is supportive of an effort to bridge the gap between research and practice.

Recommendations

In the opinion of the researchers, we feel the study was very successful. Cooperative learning seems to work with special needs students as supported by previous research with other student populations. These participants may have needed more instruction and guidance to teach one another, but a longer study would have given more conclusive evidence.

There were some significant limitations to this study and a more thorough research study is suggested. Unfortunately it was the end of the semester and there was a short time frame for the observations. There was some difficulty setting up the computers

and technical problems were encountered once they were installed. Along with that, the student observers were inexperienced and had conflicts with their school schedules.

Ideally this study would have been done over the length of a semester or an entire school year. More time in the classroom observing the students prior to the study would have been preferred. This would have generated more information on the students' current learning styles.

However from the research, the indications are that kids need to learn to work cooperatively. It is assumed that cooperative learning is not a skill any student learner will possess prior to classroom exposure. Even though each student is an individual with personality differences, students have something to offer the others students in the classroom environment. As observed in this study, one student did not object to showing the other students how to complete a task, but wanted to work alone. It appears both special needs students and other student populations can work cooperatively.

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Kid Pix Task Analysis

Wacky Pencil:
. Selects the pencil icon
. Changes Shape of line (circle vs. square)
. Changes thickness of line
. Changes pattern of line
. Changes color of line
. Draws with pencil

Line:
1. Selects the line icon
2. Changes thickness of line
3. Changes color of line
4. Changes pattern of line
5. Draws a line

Wacky Eraser:
. Selects the eraser icon
. Selects the type of eraser
. Activates the eraser

New Page:
1. Click on File
2. Drag/scroll to New
3. Save and click on yes

Date: ___ / ___ / ___ KidPix Collaboration	Target Skill	School: Kittrell Elementary Classroom: Ann Donat CODES Observer: ___	
1		E= Engaged in computer task (pushing keys, using mouse, looking at screen, talking about computer program/skill)	
2		P= Passive (sitting appropriately & quiet but not interacting with computer program or other student	
3		O= Off task; engaged in an inappropriate task (not using KidPix program, leaves computer station, talks to other students about other topics)	
		PB= problem behavior (e.g., tantrum, aggression)	

Start Time: ____   Five Minutes of Time Sampling (1 minute intervals)   Stop Time:____

S	1		2		3		4		5	
1	E O	P PB	E O	P PB	E O	P PB	E O	P PB	E O	P PB
2	E O	P PB	E O	P PB	E O	P PB	E O	P PB	E O	P PB
3	E O	P PB	E O	P PB	E O	P PB	E O	P PB	E O	P PB

Directions: Complete first 5 minutes of observation. Observe student from front or side. On signal, observe students for full minute. Based on behavior for most of interval, score each student. Complete 10 minutes of field notes. Complete observation form for second 5 minute interval. Complete 10 minutes of field notes.

Appendix B

The observation sheet used to collect interval data during a 5-minute time sample.

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Appendix C
Field Notes about Students

<u>Jamie</u>

4/10 observed by Annie

-Jamie starts this session with control of the mouse. Her partner attempts to take over the mouse by reaching for it. Jamie continues to work with the program, but allows her partner to do keyboard functions. Jamie's partner gains mouse control and Jamie watches for a few minutes. She then informs her partner that he isn't suppose to be working with a particular tool and eventually takes the mouse away. She works with icons in which her partner has verbally suggested and opens a new document when he tells her too as well. Her partner leaves the computer prior to the end of the observation schedule and she continues to work within the program.

4/12 observed by Christine and Tammy

-Jamie was observed working on the stamp, eraser, paintcan, speaking balloons, paintcan again, and mixer throughout the 10 minute field note observation. She did turn to talk to the observer for a short period of time as well. The second 10-minute section, Jamie encouraged her partner to work on making a picture and erasing the picture through verbal interaction.

4/14 observed by Christine and Tammy

-Jamie started this session by using the eraser tool. She gave mouse control to her partner, but requested that she not be too long. Her partner voluntarily gave her back control over the mouse. Then Jamie's partner tried to assist her verbally, but Jamie interjected by requesting that she wait her turn. Eventually they fought over whose turn it was and discussed the concept of sharing. Jamie informed her partner that it was not her computer. Then Damien called over from the other side of the room that Jamie never shares with him. Jamie and her partner wrestled for the mouse, but were distracted by room noise and both walked away from the computer before the observation time ended.

4/19 observed byTammy

-Jamie verbally interacts with her partner from the start by requesting her name be typed. Her partner isn't able to type her name, so she assists by showing her partner where the letters are on the keyboard. She takes over the keyboard and finishes typing her name. She compliments her partner for typing. After she finishes, she notices her partner is off-tasks and asks, "What are you doing"? "Do you want me to do bubbles?" After the verbal interaction, her partner takes over and plays with the eraser. Jamie decides it's her turn again and starts to use the stamp. She verbally interacts with her partner, but keeps control of the mouse. Eventually she offers her partner a turn. After a short time, she

states that it is her turn again. They share back and forth for awhile and Jamie helps her partner. Jamie then verbalizes that she wants to show her partner something new. She gets a new page through the file menu. She is disappointed when her partner didn't repeat the process, so she provides guidance in a step-by-step manner. She asks for confirmation of the assistance and then starts to work on her own. She ignores her partner for the rest of the observation, but stays on-task. Jamie uses the patterns, eraser, paintbrush, paintcan, mixer, and stamp.

4-26 observed by Tammy

-Jamie began this session with her head down. She tried to grab the mouse from her partner. When her partner refused to give her the mouse by throwing a tantrum, Jamie backed down by stating, "Fine be that way, you can use it." Then a student from across the room informed the teacher that she was not using the computer. Jamie told the teacher her partner wasn't willing to share. The teacher discussed sharing with the entire class and Jamie's partner gave the mouse to her. She then explored the pictures that can be printed and colored them in. Later in the session Jamie suggests her partner try to bring up a new picture. Her partner tries to complete this task, but Jamie grabs the mouse and gets the new picture. She gives the mouse back right away and then gets off task by reviewing the class schedule. When her partner has trouble saving, Jamie returns to help. She gives the mouse back right away and requests to go to the restroom. When Jamie returns she assists her partner in another task, but returns the mouse right away.

4/28 (2 students at 2 computers) observed by Tammy

-Jamie uses the stamp. Her partner wants to do this as well, so Jamie shows her partner how to use the stamp. Jamie then shows her partner how to change the stamp sizes. Jamie notices that her partner doesn't try this. At this time Jamie closes out of KidPix, but she continues to work on the computer in different programs. Eventually she looks at her partner's screen. Then Jamie's partner asks for her help. She leans over and helps her partner get out of the slide show feature. Eventually Jamie opens KidPix back up and works in the slide show feature. Her partner asks how she is completing tasks and Jamie ignores her partner. Eventually her partner watches Jamie and figures out the task. Jamie continues to ignore her partner and asks another student to come to her computer. Both students continue to add pictures to their slide shows. Eventually they both open the movie screen to preview the show. Jamie's partner has her volume turned too loud and mentions this to Jamie. She then helps her partner adjust the volume control.

From Annie's followup

-The teacher informed us that over the past couple of weeks Jamie has really explored the program on her own. The only part of the program she says she didn't learn is the paintcan. When asked if she was shown the paintcan by Curt, she said no. Then she said the only thing Curt did show her was the paintcan. Overall, it appeared that Jamie did

teach her skill to the other students. She seemed to enjoy having the knowledge and them teaching them a new skill. Jamie is a kind person who did not mind sharing with her peers. She will also work with something until she has a basic level of understanding and can do it on her own. Shared everything verbally and seemed to want to impress the observers.

Curt

4/10 observed by Annie

-Curt attempts to take control of the mouse from the beginning. When he doesn't get control he verbalizes what his partner should be using and then takes the mouse anyway. Curt explores his target skill and then works with the bomb eraser over and over. Eventually his partner takes back mouse control, but he again verbalizes what they should be doing. Then Curt walks away from the computer prior to the end of observation time. The teacher asks him if he is done and he says, "all done". Curt leaves the room with the teacher.

4/13 observed by Bob

-Curt started the session by paying attention to the computer and soon asked for a turn. His partner denied his request and they argued over control of the mouse. After awhile Curt turned and watched the observer instead of the computer. He tried to get up and take control of the mouse again, but his partner told him to sit down. He sat down and was passive. During the second 10 minute field note interval, Curt had control of the mouse. His partner tried to take over, but Curt would not allow it. He remained engaged in the task until the end of the observation.

From Annie's followup visit

-Curt does not like to work with peers. Observations showed that he did not work well with his peers only any occasion. If he was not allowed to control the computer and do his own work he would just walk away. Based on Annie's general observations she feels that Curt does not interact with his peers unless it is required of him. He is perfectly happy working on his own and allowing the other students to watch him. However, he does not verbally interact with his peers. He will repeat an action on the computer as many times as they request, so that they can learn from him by watching. Curt did have previous experience with this program, so he was able to show the students a lot of different skills.

Daniel

4/10 observed by Tammy and Christine

-Daniel repeatedly looked out the back window or watched the other students and teacher in other parts of the classroom. He would watch his partner explore the eraser and paintbrush options, but the classroom was top priority. Eventually he became interested in the story from the front of the room.

4/12 observed by Tammy and Christine

-Daniel watched his partner for a short time, but eventually became off task and focused on the classroom environment. He stayed off task until his partner worked with the eraser. He became interested in the "firecracker" portion of the eraser. His partner showed him how to use it by explaining to him that he needed to draw a picture before he could use the eraser. Daniel then experimented with the paintbrush and eraser options.

4/19 observed by Tammy

-Daniel and his partner start out by verbally interacting. He states that he can't do certain things with the program. His partner offers assistance and he allows her to take over. He responds by going up to look out the window until he is drawn back to the computer. He gets a chance to control the mouse and uses the firecracker eraser. Then his partner takes over, but he watches and they eventually start to take turns. Each time Daniel is offered control, he explores with the eraser. The two students verbally interact for quite a while, but the other student dominates the conversation and the computer. Daniel is shown how to do a new task, but does not perform it correctly. After a little guidance, he is able to complete the new task. After this point, Daniel is no longer paying attention to the computer and starts to tell stories. Daniel watches out the window for the rest of the observation time.

4/26 observed by Tammy

-Daniel starts the session by exploring the computer. When his partner reaches for the mouse he throws a tantrum. Daniel goes back to exploring once the mouse is returned. Eventually a student from across the room notices that Daniel's partner is not using the computer. The teacher gives a brief lesson to the class on sharing. After the lecture, Daniel shares the mouse with his partner. When Daniel gets control of the mouse back, he explores the stamp. Then he tries to get a new picture. When he can't complete this task, his partner shows him how to do it. Daniel then tries to save the new picture, but gets confused. His partner again assists him and gives the mouse control right back. Daniel goes back to exploring the stamp and the eraser. His teacher suggests he try to get

the stamp of the dinosaur. His partner grabs the mouse and gets the dinosaur. Daniel then gets the mouse right back and adds more dinosaurs to the screen.

Follow-up visit observed by Annie

-Daniel completes all the tasks he is interested in completing. The teacher mentioned that Daniel will allow the other students to stand behind him while he is working on the computer. They ask him questions, but he does not respond verbally. He responds to the questions by completing the tasks on the computer. He will do it repeatedly to show the other students. However, Daniel does not stay focused on the program for very long time intervals. He gets off-task and becomes interested in other things from the classroom. The teacher mentioned Daniel has worked with the program in the past, therefore it is not new to him.

Larinda

4/10 observed by Tammy and Christine

-Larinda explored with the eraser, paintbrush, shapes and colors, and pencil. She became distracted for a short time while the teacher chose a book for the classroom. However, she returned back to the program shortly thereafter.

4/13 observed by Bob

-Larinda had control of the mouse and she would not allow her partner any control. She continued to verbally deny her partner a turn and made funny noises while she played with the stamp. While Larinda worked on the program, her partner started to get off-task by standing up. She told her partner to sit. Finally Larinda lost control of the mouse, but tried to take the mouse back. When she didn't regain control, she put her head down for a short time. Eventually, she started to play with the computer disks that were on the desk. In the end she asked if she could play again.

4/14 observed by Tammy and Christine

-Larinda asked right away when it would be her turn. When she was given the mouse, she experimented with the paintbrush and gave the mouse back. Then Larinda requested that her partner try out specific tools in the program. Eventually she informed her partner that it was her turn again because she had had a lot of turns. When Larinda still doesn't get mouse control she continues to give directions to her partner. Then they verbally argue over whose turn it is and the fact that her partner isn't sharing. Larinda defends herself against the verbal attack, but then the partners get physical by fighting over the mouse. Both students walk away prior to the end of the observation time.

4/28 (2 students at 2 computers) observed by Tammy

-Larinda asked her partner how to do the same task she was doing right away. Larinda works on the stamp after her partner shows her how to complete the task. Then Larinda explores to the slide show feature. She tries to show her partner, but cannot get her partner's attention. Larinda continues to work on advanced features of the slide show. After a while her partner again completes a task Larinda is interested in. She asks her partner to show her, but is still ignored. Larinda watches long enough to be able to complete the task on her own. Both students continue to add pictures to their slide show. Then, Larinda notices her partner is able to view the show in a movie screen. Larinda opens the movie screen and her partner leans over and shows her how to bring up pictures in the movie screen. Larinda expresses her concern that the show is too loud and her partner helps her turn down the volume.

Follow-up visit by Annie

-Larinda is able to complete all the tasks for KidPix. The teacher mentioned that Larinda has had past experience with the KidPix program. Larinda likes to work with the program when she is in control of the mouse otherwise she gets easily distracted.