Exploring the Use of Peer Tutors in Introducing Software to Young Children, 4(1)

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Abstract

Two primary school children, acting as peer tutors were videotaped introducing the game, The Logical Journey of the Zoombinis, to classmates. This popular problem solving mathematical software immerses children in dynamic learning environments. The peer tutors were effective. Unlike traditional peer tutoring situations, the power of the computer to change the variables modified the role of the tutors. They became actively engaged in problem solving. We recommend peer tutoring as it benefits children, peer tutors and teachers. Management issues surrounding the use of computers in classrooms may also be reduced by allowing the teacher to become more of a facilitator.

Introduction

As a professor and a PhD graduate student we were excited to co-teach a new undergraduate elementary education methods course entitled: Exploring Technology in the Elementary Mathematics Classroom. We had planned to have our university students observe young children interacting with computer software and were fortunate to have the University of Alberta Child Study Centre (children ages four to nine) located in our building. Due to the large number of children participating from the Child Study Centre we made a decision to use peer tutors at two computer stations. We were curious as to the interactions that might arise between the children and the peer tutors, therefore we decided to videotape the sessions. This paper informally investigates the interactions of a first grade and a third grade tutor who were introducing a popular mathematics software program entitled "The Logical Journey of the Zoombinis" to their classmates.

Choosing Software

The Logical Journey of the Zoombinis is a highly motivational, interactive mathematical game that, "begins with sorting and classifying activities common in primary grades and grows to include attributes, logic, combinations, arrangements, and graphing with connections to algebra and functions as well" (TERC, 1996, p.1-2). We chose this program because our university students had spent time playing it and found it highly motivational but challenging. Many of them expressed doubt that young children could successfully play the game and they were very curious to see how children would interact with the game. Although The Logical Journey of the Zoombinis is recommended for ages eight and up, we knew from our experience of using this software with a variety of children that many children younger than eight are highly motivated to play the game, and in fact can do most of the first level of the game (the game has four levels). However, at level two the activities become too difficult and the children quickly become frustrated. Initially we had intended to work only with grade three students, however we decided to include the younger children due to their teacher's request. We also felt that our university students would benefit by observing children of different ages interacting with the same software.
Grouping the Children and Selecting the Tutors

When our university students explored The Logical Journey of the Zoombinis, they worked in pairs and we noted that the program promoted a lot of problem solving dialogue between the students. We had discussed that an important criteria for good problem solving software was the promotion of mathematical discourse and reasoning as recognized by the NCTM’s Curriculum and Evaluation Standards for School Mathematics (1989). Therefore, to encourage ‘math talk’ among the children we placed the children in groups of two or three, each group assigned to one computer.

Although we had both informally observed many children working together with computer programs, neither of us had closely examined the interactions of children working together on computers. We were both very curious regarding the use of peer tutors for introducing software, and wondered if the tutors would be accepted by their peers, and if in fact, peer tutors were required at all with such motivational software.

We knew that two of the children from the Child Study Centre had played the Zoombini program extensively at home. When we asked these children, Kim and Tina (pseudonyms), age six and eight, if they would like to show their peers how to use the Zoombini software, they both expressed excitement at the prospect and agreed.

Observing the Tutors

The first videotaped session included Tina, (age 8), tutoring a grade two and grade three boy, while two other grade three boys worked independently on a second computer nearby. The second videotaped session involved Kim (age 6) tutoring two grade one girls. Each of the peer tutors worked with the children for about one hour.

We viewed the videos of both peer tutors, focusing our observations on the dialogue between the peer tutor and the students learning the software program. We began by watching Tina with the two boys. Tina began by explaining how to play the game in a very directive manner with comments such as, "Let me demonstrate"and "Don't do that! Don't do that!" Although it appeared that she wanted to take control of the mouse in order to demonstrate the activity, instead, she frequently touched the screen as she explained or clarified what she meant. After her explanation of the first activity (the Allergic Cliffs), one of the boys quickly replied, "Oh, I get it", and immediately became engrossed in the activity. Once the boys understood each activity, Tina focused on providing supportive statements such as, "Very good thinking!" and, "Don't worry that you didn't get it". In addition to providing moral support, Tina decided after the first activity, that the boys should take equal turns with the mouse.

Throughout the entire session she monitored turn taking. As the game progressed through each new activity, Tina continued to give verbal directions for each activity. She supported these directions by frequently touching the screen to point out which Zoombini to move or where to place the Zoombini. She also shared her strategies for each activity as well as her likes and dislikes. We found it interesting that she appeared to assume the boys would feel the same as she did. For example, at the beginning of one new activity, she stated, "You won't like this one".

Throughout the entire session we felt that the boys considered her the expert as they listened to her and followed her suggestions. However, they rarely made eye contact with her or responded to her verbally, but instead discussed possible strategies with one another. It is interesting to note that she stood behind or stood beside the boys the entire session, in the manner of a traditional classroom teacher. For the entire hour, the boys were very absorbed, watching and doing.

In contrast to Tina who stood apart from the boys during the entire session, Kim began her session by casually sitting with her two grade one peers. She quietly squeezed in and shared a chair with one of the girls. She then stated, "I have to show them to tell them", and instead of pointing to the screen like Tina, she took control of the mouse as she explained and demonstrated the first activity. The group quickly negotiated turn taking and all agreed to move two Zoombinis each before giving up control of the mouse. They consistently followed their rule of moving two Zoombinis each throughout the entire session without further discussion. It was apparent throughout the entire session that there was more discussion among the grade one girls than among the grade two and grade three boys. The two girls constantly dialogue with each other and with the peer tutor. The nature of the dialogue was related not only to the successful completion of each part of the game but to social situations within the game. They talked about how the Zoombinis looked, which Zoombinis were their favorite, what their names were (each Zoombini character has its own name). For example, when the girls were creating the Zoombinis at the start of the game, one stated, "Let them all be friends, be nice!" Along with an increase in conversation, we also felt that Kim used more mathematical terminology for her age. For example, when playing the activity, (Captain Cajun's Ferryboat), in order to get across the river, the Zoombinis needed to find a seat on the ferry. Kim explained, "To put them on the log they have to have at least one thing in common". Tina's explanation for the same activity was much different in nature. She stated, "Just take that girl and put it here."
There was also a great deal of non-verbal communication demonstrated by the grade one girls as they continually put their arms around each other, made eye contact, and frequently smiled at each other. Although we felt the two girls considered Kim the expert, she was also included as a member of the group. She began as a tutor, explaining each activity and then quietly made the transition to becoming a part of the group as they all took turns playing the activity.

Throughout the session Kim’s language was very different than Tina’s. She frequently used more tentative statements such as, “I think, maybe, probably, it could be”. Kim gave choices, for example she asked the girls if they would like to take the “Hard and fast route or the long and easy route” when confronted with a decision as to which activity the Zoombinis would go to next. From these observations we recognized that Kim’s informal approach to tutoring was very different than Tina’s.

Reflections: Similarities and Differences

After viewing the videos once again, it was apparent that although the peer tutors had very different styles, similarities did exist. The most apparent similarities that we found were that both tutors expressed concern regarding fair turn taking and both gave verbal and non-verbal directions for each new activity. We expected that giving directions would naturally occur during peer tutoring but we were surprised at the emphasis that both peer tutors placed on fairness and taking turns. Perhaps this is due to the fact that the Zoombini software is considered a game and from our experience with teaching young children, and as parents, we know that young children are very concerned with fairness and taking turns when playing board games or outdoor games. We acknowledge that rules are important to young children and they will often create their own rules for games.

The most obvious difference between the two sessions was that the peer tutors had very different tutoring styles. Tina was very directive and her style seemed to be similar to a traditional classroom teacher, while Kim’s style reminded us of a team captain who is a leader as well as a participant. One possible explanation for Tina’s traditional style may simply be that she has spent more years in the classroom. It is difficult to speculate why the peer tutors interacted so differently with the children. Perhaps it was the difference in age of the tutors, or the gender differences between the two groups, or simply the different personalities of the tutors. Regardless of the difference in their styles, we felt that both peer tutors achieved the goal of teaching the children how to successfully play the game.

In our opinion, both peer tutors were effective. Throughout both sessions, all of the children with peer tutors appeared to remain focused and motivated. We speculated that it could have been the motivational aspect of the software or the fact that the children worked in pairs, rather than the use of peer tutors, that were key factors for success. This led us to wonder if the children even needed a peer tutor in order to successfully play the game, until we recalled the two grade three boys from the first video, who were working independently on a computer nearby. We remembered that the boys were off task and therefore we went back and viewed the video again, this time focusing on the two boys working alone. Early in the session we observed that they seemed to become frustrated and began to argue about what to do and whose turn it was. A short time later, one boy wandered away from the computer to look at a book. After several minutes, he returned and asked us for help. We observed that throughout the hour, the boys continued to require assistance in taking turns fairly, as well as how to play most of the new activities in the game. They required ongoing adult intervention and clearly this group was much less focused than the children with peer tutors.

Recommendations

Although this was initiated as an informal investigation, we feel that peer tutoring is a worthwhile and beneficial way to introduce and help children play, The Logical Journey of the Zoombinis. We felt the peer tutors, as well as those being tutored, benefited from the experience as they too were actively involved in playing each activity. We support the use of peer tutors to introduce problem-solving software that immerses children in dynamic learning environments, such as The Logical Journey of the Zoombinis. Unlike traditional peer tutoring situations, where tutors may repeat the identical task many times, the power of the computer to change the variables within each problem allows the problems to constantly change. Therefore, the same activity can be played many times with different outcomes. An added bonus is that the tutor also becomes actively involved.

Not only is peer tutoring beneficial for the tutors and children, but it also benefits the teachers. Perhaps the greatest benefit for teachers in using peer tutors in a computer environment, is the reduction of management issues which commonly occur. Effective use of peer tutors should allow the teacher to become more of a facilitator and provide more time to observe children interacting with the software.

However, we are not advocating that the job of teaching children to use new software rests solely with peer tutors. The teacher still needs to be familiar with the goals and outcomes of the software as well as curricular connections before it is introduced to the children. Once the teacher is familiar with the software, he or she can identify children as
peer tutors. The knowledge required to be a peer tutor will depend on the nature of the software. For example, when introducing *The Logical Journey of the Zoombinis*, we recognized that the peer tutors needed to understand how to play each of the twelve different problem solving activities within the game, as well as identify specific procedures for each activity, rather than identifying the solution for each problem.

As a result of our informal investigation we advocate the use of peer tutors which we feel benefits teachers and all children involved in the experience. In the future, we hope to again incorporate the use of primary children as peer tutors in our computer course. We also recognize the importance of exposing our university students to the possibilities that arise through the use of peer tutors in a computer environment and will include this topic in future class discussions.

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**References**


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