

Effect of PowerPoint on Student Reading Comprehension

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Abstract

The information collected by us is a series of readings that are directed towards and related to our diverse population at our school located in Northern, California. Our research needed to focus on our population to understand their learning processes, and to help them overcome problems in reading comprehension. We focused on three areas: cooperative / peer learning, problem based learning and the use of PowerPoint in the classroom. We hope to show that through the use of student created PowerPoint presentations, our students will achieve a higher degree of comprehension than their fellow students who did not receive this training.

Cooperative and peer learning in education

Cooperative and peer learning techniques have been described by Topping (2005), Ellison, Boykin, Tyler & Dillihunt (2005), Vermette, Harper & DiMillo (2004), and Ryba & Selby (1995) as being an acquisition of knowledge being shared among peers to gain knowledge of subject matter. Researchers also discussed multiple ways of approaching student's needs of diverse cultural backgrounds as well as students with educational challenges. Gains in motivation, confidence, self-esteem and enjoyment were observed during cooperative learning projects.

“Peer learning can be defined as the acquisition of knowledge and skill through active helping and supporting among status equals or matched companions.” (Topping, 2005. p.631) In theory, people who are not professionals or teachers, helping each other to learn fall into this category. Topping claims that this process is centuries old, but there have been major changes within the last twenty-five years.

Peer tutoring is very specific by means that there are intended roles. The roles consist of a tutor and tutee relationship. Tutors are given clear procedures to follow to guide interactions, in turn tutees receive generic or specific training. Some of these peer tutoring methods seek to scaffold data with specific or structured information or materials

Cooperative learning is looked to more than just working together. R. E. Slavin looked at cooperative learning such as, “structuring positive interdependence in pursuit of a specific shared goal or output.” (Salvin, 1990) This process involves specific goals, tasks and rewards guided by the teacher would guide the process. A cooperative group typically contains 4-6 same-skilled learners and often requires guidelines to ensure equal participation. These groups will usually jigsaw their information to create a sense of individual accountability.

Topping fears that many schools might feel that they are conducting peer learning, when in fact that they are placing children in groups and just hoping for the best. A 1994 study conducted by Bennett, Desforjes, Cockburn and Wilkinson found that when students were placed in groups, most students worked as individuals. About one-sixth of the time of time was spent interacting with the others within the group, and even most of this time was not related to their task. Unknowledgeable students tended to give false or misleading information and praise and positive feedback was given when not called for.

When either peer learning or cooperative groups are used, the results are most times good. Research conducted by Topping and Ehly (1998) showed that evidence was clear that both peer learning and cooperative learning will show highly improved gains in subject comprehension in the targeted core area. In regards to cooperative learning, a gain of information is shared by all members of

the group. In peer tutoring, both tutors and tutees can gain if the organizational structure is correctly developed.

Both peer learning and cooperative learning can simultaneously yield gains in cross-student social and communication skills, self-esteem, liking group work, and enjoying subject matter. "Peer learning has also been noted to be among the most cost-effective of learning strategies." (Levine, Glass, and Meister, 1987. p. 635) One must also be careful since there are occasional reports of peer learning program that did not show anticipated outcomes.

Universally peer learning and cooperative learning are the most used tools to build comprehension, new ideas are being introduced which have not been fully evaluated. Peer counseling can sometimes be effective as adult counseling in regards to bullying behaviors. Peer assessment is another new area that has seen some growth. Here, peers evaluate the outcome and production of others in their group.

Much of the research conducted within peer learning has been done within a school environment. Peer tutoring has been found to be useful even with kindergarteners and first grade students (Fuchs, Fuchs, Mathes, & Simmons, 1997). Peer learning is now being used in colleges and universities. Peer learning is increasingly being used because of the long standing failure status of those needing to be helped.

Research (Maher & Thruston, 1998) has shown recently that those students with problems can act effectively as tutors. A study (Spencer & Balboni, 2003) conducted in 2003 reviewed 52 cases in which elementary and secondary school students, with mental retardation, served as tutors and or tutees in academic, social, and daily living/self-help skills.

Programs using peer learning and cooperative learning also seem to have other areas of improvement show up in those students as a result of the group experience. Attitudes towards school change and they see their teachers in a more positive light. They start to like what is being taught, and they react better with peers, raising their self-esteem. Poor students tend to develop educational resilience which might help them cope with transitions to less optional learning experiences.

In a study conducted by Ellison and Boykin (2005) the researchers observed classroom learning preferences of elementary school students attending a low-income school were observed. 138 5th and 6th graders were evaluated, 66 African-Americans and 72 White. The researchers wanted to see if the students preferred cooperative, competitive, or individual learning.

Cooperative learning has shown increased effects among students of different cultural backgrounds, many argue that these effects are more pronounced for students of African-American decent. It is believed that African-American students perform better in this type of an environment because of

cultural norms and socialization patterns that are dealt with in the student's out-of-school experiences. If educators use methods proven to help African-American students, only then will they be able to restructure their learning environments to greatly enhance academic gain for this segment of our population.

Students were taken out of their normal classrooms to a room that served as a testing site where twelve students were tested at one time. The students were then informed that the study was to find out how they would best like school groups to be conducted. Students were then given a ten minute questionnaire and informed of their right not to participate in the study. Each student worked on the survey individually, and then handed it back to the researcher when it was completed.

When the results were tabulated, it was found that the African-American students chose cooperative learning as their best means of understanding core studies. White students also chose cooperative learning, but almost equally chose competitive and individualistic learning methods. Since both boys and girls were used in this study, no major effects emerged in the case of gender.

For Panitz (1999), cooperative groups were seen as groups in which students work within small groups to succeed at specific learning objectives, and where these same students are interdependent for closure of that project or objective. One of the most outstanding effects of cooperative learning is a raise

in self-esteem, which in turn causes the student to participate in the learning process. When students help each other they build a supportive community that helps to heighten the performance level of each of its members. "General guidelines for classroom motivation suggest emphasis on challenging, engaging, informative activities and the building of enthusiasm and a sense of responsibility in learners. Well developed instructional strategies such as cooperative learning offer many potential benefits to learners." (Johnson & Johnson, 1989. p 700)

When students form cooperative groups, they tend to take ownership of the assigned task which leads to those same students becoming encouraged to work towards completing that specific goal or task. In a regular classroom setting when a teacher calls on a student, then that student becomes the focus of attention, if that student makes a mistake, then the entire class will become aware. In cooperative groups, facts are shared among individuals and attention is diffused among the entire group setting. Also within that group, members can review information and correct any problems before their information is discussed class wide. In cooperative groups, test anxiety is also reduced (Johnson & Johnson, 1989).

Cooperative groups also tend to create an atmosphere where learners feel both respect and a connection to each other in their group. It tends to create a strong social support system in which students work cooperatively with each other much the same as they will need to do later in life.

Cooperative groups tend to focus on accomplishments of the group and also for individuals with the group. Within these groups, students tend to criticize ideas and not people. This process shows students how to solve problems in a manner that is friendly and fair to all. Students will learn to challenge ideas and persuade others towards their own interpretations. This type of learning also helps to empower female students and puts them in a place of leadership within a group setting, thus allowing male members to look towards females in these types of pressure situations (Bean,1996). Cooperative learning builds learning communities within classes or institutions.

Cooperative learning helps to promote higher level learning skills (Webb, 1992). When students work in groups of two or three, they create effective teams where one person is talking and the others are listening while the speaker is discussing the question in need of research. Here, all parties are developing important problem solving skills and practices by creative ideas, talking about them, giving each other immediate feedback, and responding to both the group's questions and comments. Cooperative groups improve whole class discussions when the ideas are shared with the entire class.

Cooperative groups enhance higher levels of performance (Bligh,1972). Critical thinking skills and a potential means of information retention improve. All of the prior aspects help create a positive environment of improved performance and the building of a student's self-esteem, which overall leads to

creating more interest in the learning process and enhanced overall performance.

Cooperative learning helps to improve a student's oral communication skills. When in pairs, students need to verbalize their ideas while others listen, ask questions or make comments on what they have heard. Clarifying and discussing one's view is a very important process of the cooperative learning and promotes a higher-order process that students need to acquire in today's educational system.

The study by Vermette, Harper and DeMillo (2004) was concerned with the research involving cooperative and collaborative learning groups that has been conducted mostly with older students, mostly of college age as being applied to younger students (Vermette, 1998). This research involving first and third graders looked at five different areas to see if cooperative/collaborative learning will work with younger aged students.

In a study using first and third graders, in Australia (Gilles & Ashman, 1998), researchers used both formal and informal collaboration across ten different social studies units during one school year. Students in the trained research group used and understood strategies like offering solutions, anticipating problem areas, and giving explanations. More information was retained using the recently learned cooperative behaviors, while this more evident in older children, one can assume that early exposure to such strategies

may make future cooperative and collaborative learning events a more empowering event.

The study showed that exposing students to a cooperative or collaborative learning environment, early on in their learning process, can give them experience with it. Having students become involved in dialogue early on will make that experience easier in their later school years.

In a study conducted by Stevahn and the Johnson's (2000), one half of a group of 5-8 year olds were informed how to resolve conflicts that normally come showed up in their classroom around six times an hour. A six-step process was produced that recognized the conflict at hand, identified their wants, identifying feelings, identifying others needs, a way of offering solutions and reaching agreements was created and shown to the students. The way this information was presented was in direct contrast to the way this type of information was usually conveyed within a classroom environment.

A peer centered math curriculum titled Number Words was used in a study conducted by Fuchs, Fuchs, and Kern (2001). Here students followed formally structured strategies to learn the number line, and this study showed that students at all ability levels showed a gain on standardized tests. This study involved twenty teachers. Another aspect of this study showed that higher performing students were not impaired by lower achieving students during the

course of this study. Researchers felt that having children work individually at this point was disruptive and fought against their sense of community.

A study conducted by Tudge, Winterhoff and Hogan (1996) showed that students who had worked in groups with partners understood more information than students who worked as individuals only when those working alone had received no feedback or information from their teachers. In a classroom, even as small as 18 students, a teacher may not be able to get to every student and provide the information they may need. Whenever possible it was always seen as best to have a student pair with another student, then a means of information can be passed from one student to another.

A study conducted by Johnson and Johnson (1980) in which forty-five middle and lower income first grade students were split into gender and ability groups and were given complex problems to solve. Students who worked cooperatively had better posttest scores than students working alone or in competitive groups.

In New Zealand researchers Ryba and Selby (1995) observed how educators are using computers to help students with special needs. Students with special needs are usually looked upon as being less capable than they actually are. Until recently special needs students had limited use of computers, and then only used them for drill and practice types of instruction. These

students used simple and repetitive programs. As a result, these students were hindered by restricted use of computers to enhance their own learning process.

The use of computers is now a widely accepted means of learning. In past years computers were believed to isolate a child, but now computers are widely used to help students work cooperatively with each other. One of the early uses of computers in New Zealand was to help adult students with intellectual disabilities learn word recognition (Ryba,1990). At that time, computers were seen just to provide automated instruction. The skills taught on computers are important for social development when students share and work on a computer through cooperative learning. Computers also provide a means to enhance intellectual growth (Clements & Nastasi, 1998).

Computers are believed to naturally lend themselves to cooperative learning experiences and towards social development regardless of the content or whether or not the student is of special needs. Cooperative learning is based on the idea that students need to depend on each other in a positive and rewarding way.

Technology and cooperative learning

The following articles by Miller & Olson (1995), and Lopez-Reyna (1997) show support for the use of technology and cooperative learning in the classroom and how computers are perceived as a great equalizer offering students of diverse backgrounds equal instruction.

The article researchers, Miller and Olson (2004) sought after able teachers that were not very tech savvy to conduct their studies. A third grade teacher was chosen who was respected by her peers, but was not very technology resourceful. The researchers gave the teacher two Apple computers to use in her classroom which only contained the traditional teaching tools such as books and maps.

The study by Lopez-Reyna (1997) was the result of attempting to create effective instructional interventions for students who were learning English as a second language and who were having problems dealing with this issue. Two prior studies had already been conducted that found cooperative learning to be successful in students that were of Mexican descent. The fact was already established that Mexican children were already culturally more cooperative, and that using this method in the classroom would help them succeed.

During the first of the two pilot studies, third-grade students were observed. These students were observed working with partners of the same or different ethnicity of either Mexican or Anglo decent. The students were

observed at 20-second intervals whether they were on their own computer or sharing one. A checklist of behaviors was used to track each student. It was also easier to track students when they were placed with student of their own gender.

The study by Lopez-Reyna involved eight students in two male student only teams. The Anglo-American students showed consistent on-task behaviors with little or no social acts, which later led to disruptive behaviors. The Mexican-American groups were on task a majority of the time, and they still managed to show social behaviors throughout their work. One student would offer to help the other student understand if the need arose. More cooperation was observed with the group of Mexican-American students. The observer was also close enough to hear the social interactions between each group of students. Students that are second language learners also tend to use their native language when helping their peers.

Problem Base Learning

Problem Based Learning (PBL) students identify problems and become self directed learners as a result. Researchers Sungur & Tekkaya (2006), Roberts (2004), and Lowther & Morrison (2003) focused on student centered PBL and the positive effects of PBL that were brought about during the shared role based process.

Problem Based Learning was developed at McMaster University in Canada. Originally it was used to solve problems based on actual medical cases. It has now been adapted for use in average schools to allow students to be placed within an environment where students can draw upon prior knowledge and thus learn within a real-world setting. (Background of Problem-Based Learning, 2006)

Students within a PBL classroom must seek information, locate learning materials, and communicate information to teachers and fellow students while working in small groups with ill-structured problems. Research conducted in elementary and high school setting has shown that PBL establishes an environment where students take responsibility for their own learning, become better managers of time-management skills, show an increased ability to define topics, access a multitude of different resources, and evaluate the validity of those resources (Gallagher, Krynock & Robb, 1996).

PBL has been shown to improve critical thinking, communicational skills, interpersonal skills, and enhance a student's interest in a current course of

study. In a PBL setting, students confront real-life problems where teachers encourage students to explore alternative solutions and possibilities, and to collaborate with other students to secure the best outcome to solve their problem. Students engaged in the PBL process tend to take ownership of their problem thus creating a need to want to solve the problem within their group via social interaction.

The PBL research conducted by Sungar and Ceren (2005) centered on sixty-one high school students (39 boys and 22 girls) taken from a large urban area of Ankara, Turkey. The students made up two classrooms that were both taught by the same biology teacher. One class was formed as the experimental group while the other group was deemed the control group. The ages ranged from 16 to 16.6 years, and all students came from middle to upper-middle class families.

In the area of treatment, the experimental group was taught PBL strategies while the control group was taught by traditional means. The area of study was both the respiratory and excretory systems of the human body. Both groups received the same exact syllabus-prescribed learning content. Students in this school had never been exposed to PBL, so both the teacher and the students were given instruction on the use and procedures involved in PBL. The control group conducted teacher-centered learning, each student had to rely on their teacher to explain all events, basic textbook reading, and worksheet study within a discussion environment.

The study by Roberts (2004) was conducted over a two year period between a group of fourth through sixth grade students using telecommunications to exchange information between classrooms in Laramie, Wyoming and Monteverde, Costa Rica. Here the subjects were separated by location, language and culture. In this research study, problem based learning (PBL) was used following a constructivist based learning model. Three teachers were involved with this task during the 2001-2002 and 2002-2003 school years.

Two questions that Roberts wanted to focus on were:

1. In terms of content-based learning, what do participants gain from collaboration in a global environment mediated by Internet Technology?
2. What are the defining considerations of virtual collaborations regarding the convergence of academic learning and computer technologies in an international context? (Roberts, 2004)

Researchers decided to use formal letter writing procedures, scan the letters and then send them as an email attachment. The internet provided a means by which letters can be scanned and sent in a timely manner. Reluctant writers even participated in this process since they knew that their new friends would expect a letter back.

Without the internet, letter exchanges would have taken two to three weeks perhaps more to reach the other school. As a result of the Friend School

students, both languages were now being used in letter writing showing that this project was student-centered.

Lowther and Morrison saw how technology use in education basically focuses on the use of software that ranges from game-like programs like Math Blaster to complicated learning systems that provide individualized guidance based on a child's performance in a particular core area. Computers are used differently when that same student enters the workforce. In the workplace, computers are used to collect and analyze data or to communicate to a mass audience or even to solve a problem. Population data are collected for cities to plan for future growth, or financial data are collected to search spending patterns.

Since school based computer usage is so different from real-world business computing, our students leave school with a limited ability to use computers for problem solving in regards to real-world situations. A 1999 study (Green, 1999) found that nearly 40% of all colleges and universities surveyed showed that computer integration as the most important technology related challenge now facing American colleges and institutions. American students were found to use email, word processing and internet browsing easy, but did not have the ability to use problem solving tools like spreadsheets and databases.

One way that was seen to help correct this lack of problem solving skills is to have students adopt an inquiry-based approach towards learning and start

using computers as problem-solving tools. Both Lowther and Morrison wrote this article and describe their step-by-step process to help develop this type of inquiry-based instruction.

A ten step plan of Integrating Technology for Inquiry (NTeQ) includes an instructor, students, lessons, and computers. The instructor must be technologically sufficient, knowing when and how to integrate computers into a problem-solving tool. The students will take on the role of researchers and thus develop technological competence. Their lesson will be problem-based, and rather than being the focus of learning, the computer will become the tool to collect, analyze, sort, and communicate data.

Microsoft © PowerPoint's use in the classroom

PowerPoint is Microsoft's presentation software that allows users to create slides, handouts, notes, and outlines. The following teachers/researchers Smith-Barrow (2005), and Kronholz (2002) all saw a great need for the use of PowerPoint in the classroom. They also make connections to cooperative and peer learning as a result of using this powerful student enabling software.

This newspaper article by Smith-Barrow (2005) is about how a Michigan teacher, Peggy Savage-Dunn, honors the computer skills of her 7 and 8 year old students who use PowerPoint in their classroom. Peggy Savage-Dunn was Michigan's 2003 science teacher of the year. Peggy believes in tapping into the computer skills of her students at an early age. The members of Michigan Association for Computer Users were impressed with the skills of Dunn's class in showcasing PowerPoint presentations on cat care and how to stop smoking. Dunn taught her students keyboarding skills, and how to layout and design a presentation. They then created PowerPoint presentations at the conference after she had taught her class how to scan and download pictures previously in class. Dunn has been a teacher for 25 years and at the time of the article is now teaching her kindergartners computer skills. She has discovered that teaching kindergarten students computer related skills is an easy thing to do these days since most of her students have had one to two years practice on a keyboard

already! Dunn has been creating web pages for her classes for the last seven years. Included on those pages are her class's internet projects, newsletters, and link to important information sites.

Kronholz (2002) observed that fourth graders at Bolivar Middle School from southwestern Missouri used to rely on the standard three-ring binders to showcase their reports about the Show-Me-State. The students are now making those same presentations using PowerPoint. Sixth graders from Billings, Montana are also using PowerPoint to create class reports on the elements. Fourth graders from Tyrone, Georgia are showcasing projects on 16th century explorers on PowerPoint. Teachers such as Kate Matthews burn her student's work on to discs and save them on her school's network so all students can access it. Christine Galagan of Cody, Wyoming uses PowerPoint in her fifth grade classroom and expects her students to produce five or more projects each year. Common book reports, graphics of maps, and biographies that used to be hand done are now being showcased using Microsoft's PowerPoint. At the Cashton Elementary School in Wisconsin, second graders have been taught to use PowerPoint to create their reports about sea animals (Kronholz, 2002).

Microsoft sells their Office products to schools at a deep discount. In 1998 the software started to become popular, and its usage has been gaining in popularity ever since. This software turns graphics, pictures, and charts into a

package that can be projected on a screen that can even be setup to tell the audience what the slides are about. PowerPoint projects also seem to impress parents in ways that written reports never could. This type of interest generates community support in a way that nothing else can, this causes parents to become involved. PowerPoint graphics are very captivating. Words can spiral into place, or fall like snowflakes into place. Pie charts can swiftly change into 3D charts that can focus on individual stats. These multimedia abilities of PowerPoint make presentations unforgettable. PowerPoint's advantages give it a secure place in the classroom. Moving student's projects on to the computer lets our children shine in their own ways. PowerPoint allows students to show off their natural skills and talents (Kronholz, 2002).

Conclusion

Overall, as we both conducted research on this topic, most information was connected to university studies and work in college classrooms, but there was some overwhelming evidence to show otherwise. PowerPoint can be effectively used in primary grade classrooms with stellar results!

No matter if PowerPoint is used within a cooperative learning environment or within a peer tutoring setting, it is a powerful tool that builds more than subject knowledge. Teamwork and cooperation is a powerful byproduct that will help any child become a productive member of any classroom.

PowerPoint is the right tool for this generation of video game savvy students who are used to focusing on a screen for visual stimulation. As children we were directed to share and cooperate with others, and the use of PowerPoint re-enforces those early taught qualities.

When children work on their own, they can miss many important points, or perhaps they can even become misguided or confused. When students work in cooperative groups misconceptions can be corrected by dialogue during group discussion. When children communicate and share they become more familiar with their subject, and that leads to students feeling better about school and themselves.

Students who create PowerPoint presentations often want to show them to everyone they meet because their projects are for the most part visually stunning. The use of this program helps a child comprehend what they are learning at any given time. Sharing what they have learned with others is expressed in a way that makes even the quietest child sound as bold as the brightest child.

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