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Full Length Review Article

BENEFITS OF SMART CLASSROOM TECHNOLOGY IN MIDDLE SCHOOL LEVEL

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ABSTRACT

This study looked at the value of educational technology to students. Researchers examined the question "How does the use of smart classroom technology effect the educational achievement of students?" The report includes extensive literature reviews that support the hypothesis that technology does improve certain aspects of the student's learning pattern. A small study was done focusing on students using assistive technology, either Smart Class or Interactive White Board, to enhance students learning experience. Quantitative and qualitative data was collected and analyzed. Researchers analyzed assessments, informal observations, and surveys in this study. The study found common themes within the data and proposed that technology did in fact improve the students' learning experience as previous studies had shown.

INTRODUCTION

Fortunately, in today's society, various learning tools have been made readily available to the students and teacher. In addition to the birth of new methodology, curriculum and practice; technology is now seen as a common educational front runner in most of our classrooms. Whether it is a so-called "smart classroom" such as the relatively new "interactive white board" or, the more familiar "PC", technology is becoming an ever present option for educational enhancement. With the recent push in implementing technology into the classroom, one can only presume that there must be some underlining validity in the notion that technology does improve certain aspects of the student's learning pattern. Because presumption is seldom safe, our group took on the task of answering a not so simple question, "Does educational technology in the classroom help students improve in areas of content learning?" In attempt to substantiate the general idea of technology in the classroom improving the learning patterns of middle school students, professional articles were collected and reviewed preceding the initial study. After literature was examined, 10 students in middle schools were evaluated to determine if educational technology increased their general learning experience in one way or another.

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Literature Review

In one study done by Golad, Baron Cohen, and Smith Myles (2007), researchers studied the use of the Mind Reading software for students with Asperger syndrome. Since social and emotional skills are one of the largest deficits for people with Asperger syndrome or ASC, it is important to explore ways to provide effective intervention. There were 8 subjects in this study ages 8 to 11 years old. The authors state that the Mind Reading software helped to improve participant's ability to recognize emotions in faces and voices. Participants were able to recognize emotions in voices both with the voices on the software, as well as with voices not included on the software. According to interviews with parents, the overall response to the program was positive. Parents noted generalization in daily living, and that their child seemed to enjoy the program. The authors conclude that the Mind Reading software is effective to teach these skills. The authors suggest that this program can be used by students at home, with parents, with teachers, with counselors, with students in the general education population, and with speech therapists. The authors also suggest that this program can be used in conjunction with other methods to teach social skills (social stories, etc). In another study by Huntinger, Bell, Daytner, and Johansen (2006), researchers sought to explore the effectiveness of the curriculum and methodology called Emer Ging Literacy and Technology (ELiTeC), which integrates technology and literacy. The study was done with 432

preschool children in 17 classrooms over the period of three years. The results showed increase in both technology skills and literacy skills. Based on the Behavior Interaction Tool (BIT), each year showed significant increases in the area of technology skills (technical proficiency, independence at the computer, and interaction with peers at the computer. Based on Early Literacy Assessment, students showed significant gains in their abilities to follow print, point to text, attend to print while reading some words, and attending to pictures over the course of three years.

In an additional study conducted by Mintz, Branch, March, and Lerman (2012), researchers sought to test the effects of a mobile technology tool that was designed to develop social and educational skills in children with Autistic Spectrum Disorders. The mobile device was a smart phone which the student and the teacher had access to. The phone was designed to work on individual goals with the students, and create reports on how the individual child was meeting his or her goal; the individual reports would then be emailed to the teacher with recommendations on what the teacher should focus on in regards to instruction for that particular child. The mobile device provided visual and auditory incentives for the student to complete his or her goal. If the child was struggling completing a particular goal, visual chart would appear, displaying step-by-step directions on how the student was to complete the task at hand. After the technology was tested in the classroom, a variety of surveys were conducted that included the students, parents and teachers. After evaluating the surveys, the researchers concluded that the general response to the technology was positive in nature. The teachers that participated stated that the technology helped the students to complete their goals, and maintain the results. Furthermore, the parent participants claimed that "the tool was highly beneficial in providing educational incentive to compete the task at hand, thus improving the child's overall educational experience".

In another study, researchers Reis, Cabral and Peres (2010) conducted research on two special needs students with intent to discover if technology based exercises were beneficial to these students in the area of primary mathematics. In the execution of this study, two students were given 22 exercises that involved primary mathematics. One of the students had cerebral palsy and the other student had intellectual disability. In 22 of the exercises, 11 of them were standard paper based exercises, and 11 were computer based exercises. All of the exercises were formatted specifically to deal with the each individual student special needs. After evaluating the research, researcher found that the educational technology tools benefited these student's educational skills in many ways. One average, the students concentration ability increased 24 seconds. It was also found that the time it took to complete the actual exercise was decreased by 34.4 seconds, implying that the computer gave the child a better understanding of the task at hand. It was also found that the students attentiveness increased by 41.4 seconds when they were able to use the computer. Overall, researchers concluded that the children's general response to learning with the computer was more positive than it was when working with paper. The researchers also found that there was validity in using technology in education to increase an individual child's educational skills. In the study The computer in the classroom: a medium for enhancing social interaction with young people with autistic spectrum disorders, Jacklin, A., & Farr, W. (2005) found that the computer can be a useful tool for enhancing social interaction for students with ASD. The study involved 12 elementary grade level autistic students from Handel School, a special school for pupils with moderate and severe learning difficulties, located in South Each of England. From the 12 students, 43 observations took place, and three pupils were selected for more focused study. Observation data from all 12 cases had indicated that around a computer there seemed to be a change in interactivity. Behaviors such as rocking, clapping, yelling or screaming were reduced. Evidence suggested that the computer discouraged unwanted repetitive and stereotypical behaviors. The computer also seemed to encourage more positive social interaction, requiring less instruction from the teacher to yield a positive response. Research showed that the computer has the potential to be a valuable device for communication. When students with ASD where around a computer, social interaction with adults become more apparent, engaging and positive. In the case studies, the computer influenced the development of more two-way interaction promoting positive social engagement. An unexpected outcome of the initial observation data of all 12 cases was that, with some pupils, more eye contact seemed to occur in the presence of the computer. Teachers saw the computer as valuable in the classroom. Evidence suggests that the computer did enhance social interaction when used in a well-defined, individualized way.

In an additional study, researchers found that increasing the intensity of graphic information, when providing computer-generated geometry instruction to students with ADHD, helps increase their ability to perform better on geometry problems. This research was presented in their article titled Computer-generated geometry instruction: a preliminary study. Traditional education research on mathematics has focused on a fixed body of information; however, this research study focuses on students with ADHD and how they are placed at a greater disadvantage in mathematics because of hyperactivity and inattention. Unlike other research, researcher focused on graphics that can enrich students' mental representations and increase their ability to generate and hold images in mind. Eighteen students, second through fourth grade, were studies from local public schools near Purdue University in West Lafayette, Indiana. Six typical comparison students randomly selected and 12 students classified with ADHD were used to perform this study (Kang, Zentall, 2011). In conclusion the authors discovered that overall, students with attention deficits perform better on advanced geometry problems with high visually intense images (HVI) when compared to low visual intense images (LVI). In addition, students with both hyperactivity and inattention perform even better than the comparison group of students with only attention deficits, in HVI conditions.

It was also discovered that HVI images can be especially helpful during new learning and can provide the basis for instructional programming and development for all learners, especially for diverse learners such as those with ADHD. In a study written by Kermamids and Collins (2009), they discuss the importance and significance of the use of Assistive Technology for young children, age's infant through toddlers. The study wanted to show if infants and toddlers succeed and

reach their goals, which was developed during an Individualized Family Service Plan (IFSP). It also showed the barriers determined that affected the use of assistive technology in rural areas of infants to toddlers. The study team quoted the Federal Government since they have mandated that the use of Assistive Technology be considered for the IFSP team when servicing a child with special needs. The study also quoted The Division of Early Childhood (DEC) and Association for the Education of Young Children (NAEYC) which is two associations that are very familiar with the best practices used to support early childhood. These divisions believe that assistive technology can help children with independence and adaptive and participation skills in the school setting which can help them with routines as well. Perceptions of Writing and Communication Aid Use Among Children With a Physical Disability by Carpe, Harder, Dr. Reid, and Tam, (2010) investigates the perceptions of children with physical disabilities regarding writing and communication aids. The study looked at determining factors that influenced the use of these aids, described the impact of these aids, and presented outcomes 5 regarding children's productivity with the use of these aids.

Assumptions

After studying the articles above, one can assume that technology in education provides multiple, educational benefits to a variety of students in special education. It can also be assumed, based off the response from the students, that assistive technology and the utilization of video, technological color, and sound provides positive reinforcement to the student's senses in a way that most teachers cannot. In knowing this, it is important for teachers to remember that technology should not be used as a replacement for one-on-one instruction, but should be used as a tool to enhance general instruction. We can also assume that the results of success in regards to educational technology are to a certain extent, dependent to the teacher's general knowledge on that particular software or device. It is the teacher's responsibility to make sure that the technological device is used correctly and appropriately to insure that maximum results are acquired. It is also important not to assume that just because a certain technology benefits one student, that it will work to benefit another student in the same way. Our students are all diverse with different educational needs, and we need not assume that a "one-size-fits- all" educational strategy will be the best approach for the needs of our classroom.

Research Question

This study focuses on the question: How does the use of smart class technology effect the educational achievement of students? With the use of smart class technology and interactive white board educational applications we explored the educational benefits for middle school students with learning. A study of two groups was performed to compare the level of educational achievement through the use of traditional instructional strategies and the use of smart class technology devices. We hypothesized an increase in education achievement within the study group receiving instruction through the use of smart class technology devices; however, we foresaw a problem in the limited number of subjects in each comparison group. Therefore, to ensure accurate measures of increased or decreased percentages in student performances, a baseline assessment was performed on all subjects involved in this study.

Significance of the Proposed Study

This proposed study provides information pertaining to the learning benefits middle school students receive when educational instruction is combined with the use of smart class technology. It is significant; in that, this research reveals that the performance of middle school students increases with the use of a smart class and interactive white board. By using a smart class technology device during instruction, we discovered that it provides the student with a broader and more conducive form of education.

Subjects

There are 10 subjects in this study, ages 11-15 years old. Each of the subjects were chosen by a researcher as subjects that could benefit from intervention for a particular goal. Researcher collected data on two subjects.

Data Collection

Due to the diversity in each school setting, specific instruments were used based on what was available at each school site. Therefore, there were several forms of technology, as well as traditional methods used for this project. As noted in students received intervention through some of form of technology program; a computer program, an application on the Smart Class or interactive white board, or some form of traditional intervention; flash cards, visuals and manipulative. Since the focus of this research project was to show an impact on individual needs, intervention was specific to the students. Therefore, data collection was specific to the student. For the student whose goal was turn learn to rote count out loud, he received credit (+) for each trial using the smart classroom technology in which he gave a vocal approximation of counting. For the student whose goal was to learn the letters in his name, he received credit for each letter that he could identify correctly.

Data Treatment Procedures

There was a total of 10 subjects used for this study each of the subjects were attending a middle school classroom and all ages ranged from the age of 11 to the age of 15. Five of the subjects were assessed using traditional methods such as visual supports, manipulative, and reinforcement. The other five students were taught with technology support such as Smart Classroom Technology, Computers, Laptops, and Interactive White Board's. Each subject received a type of intervention from a trained professional teacher, which were the investigators. Each student from both interventions where taught a skill that they did not have or were struggling to gain. After each student received intervention with either traditional methods or technology methods, they were then assessed after the intervention to see which students showed more progress.

Presentation of Findings

The study seemed to prove that the students that received technology intervention with the use of Smart Classroom

Technology, Computers, Laptops, and Interactive White Board's seemed to make more progress. The students that used technology intervention increased their skills and learned the skills faster. These students also enjoyed the intervention and showed more enjoyment of learning. Some of the investigators observed, that negatives behaviors decreased such as hands in the students mouth, unwilling to attend to work or sit for longer periods of times, and refusal of doing work. Some of the verbal students would state, "This is fun, "I want to do my work on the Technology." Students that used the technology intervention understood the assignments quicker, and were eager to gain the knowledge and skills in order to gain the reaction of having the correct answer. Students that learned the skills traditionally did not gain as much knowledge of the task and did not show as much enjoyment when completing the task. Their behaviors did not improve, and some instructors even experience more "melt downs," or negative behaviors while teaching the new task. Overall, all the teachers agreed that the use of technology devices while teaching is very beneficial, helpful and enjoyable when teaching their students.

Conclusion

The study found a direct correlation between the use of technology and educational enhancement. Every student included in the study had an increase in successful completion of their educational goals. With continued use of technology as a supplement to instruction, it is our belief that technology can bridge the gaps students.

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