



Assistance with University Projects? Research Reports? Writing Skills?

We have got you covered!

www.assignmentstudio.net

WhatsApp: +61-424-295050

Toll Free: 1-800-794-425

Email: contact@assignmentstudio.net

Follow us on Social Media

Facebook:

<https://www.facebook.com/AssignmentStudio>

Twitter:

<https://twitter.com/AssignmentStudi>

LinkedIn:

<https://au.linkedin.com/company/assignment-studio>

Pinterest:

<http://pinterest.com/assignmentstudi>

Has Technology Positively Affected Mathematical Education?

Introduction:

My research question deals with the impact of technology on mathematical education. More specifically, it questions whether technology has aided in teaching mathematical concepts in well elaborated way. It has been observed that students from all classes face significant problems in grasping mathematical concepts. Many of these devices have been implemented in educational institutions. However, no major researches are done to investigate if the implementation has positively affected mathematical education. It is imperative to explore the positive influence technology had on the teaching of mathematics to student. This paper will question if the impact of technology on delivering mathematical concepts is positive.

Importance:

The study holds importance because mathematics is one of the fields where efficiency is particularly low among students. The problems persist in schools as well as universities. Several problems exist, especially, while delivering mathematical concepts (Nilsson & Luchinskaya, 2012). During the last three decades, massive technological innovation has taken place, including manifested through the rising users of personal computers, tablets and pointing devices (Chesbrough, 2003). Most of the students find the lectures dry and lose interest after some time. While others find it difficult to understand the concepts verbally and hence require understanding problems through figures on drawing boards. Sometimes, creating an image of the problem becomes tricky. For example, drawing a two dimensional figure is easy but handling three-dimensional figures become difficult to white boards and hence require graphics programs. It is also observed that courses like calculus are easy to solve using software like Wolfram Alpha (Chesbrough, 2003). It has also been observed that sometimes instructor are unable to clearly explain the problem. The amount of data, figures or accuracy makes it difficult to deliver the key issues. So, I consider, through usage of technology these problems can be solved. Technology like electronic boards and computer screens can help in explaining problems, defining key issues, presenting data and also involves the ability to produce three-dimensional images (López, 2010). Implementing technology has the capability to enhance students' efficiency in learning or understanding mathematics concepts, thus it can be beneficial for students across universities, colleges and schools. Also, this study might find the process through which students' efficiency for learning mathematics can be increased. I consider it is vital to solve this problem because mathematical knowledge is later transferred to several fields which include economics, finance, accounts and engineering to count a few. Without addressing the problems existing

in delivering mathematical knowledge, we cannot expect to obtain significant improvements in fields which derive assistance from mathematical knowledge.

Definition of key terms:

Technology is defined as the practical implication of science into various fields of life. Various ideas exist in the field of science, once these ideas have been worked on and implemented into some field of life, it becomes technology. Positive impact is another key term which needs definition. From positive impact I mean that the students must have benefitted from the technology. It means either the communication has become easier between teacher and student or the students are able to grasp concepts in better way with usage of technology. In both cases, the technology must have increased students' efficiency. Now, it is critical how efficiency is defined. Efficiency means the student is able to enhance his or her performance once technology is used. It might be through obtaining better marks in exams, producing better ideas, understanding same problems in less time, reduced time to convey a concept by instructor and reduced time to solve questions.

Review and Analysis of Literature:**Schacter:**

Schacter (2000) reviewed various studies done on impact of technology on education. The study included various researches including study on 500 individuals, partnership among Apple Inc and students, studies conducted on fourth and eighth class students and a ten year study conducted nationwide. Based upon the analysis of the studies, it has been concluded that use of technology has both positive and negative impacts on student learning in the field of mathematics.

Positive Impacts:

Schacter (2000) found that average percentile of student with computers was 64th percentile while percentile of those without computers was 50 only. Also when taught using computers, the mean time for students to understand problems reduced significantly. When computer based problem solving methods were used, students' arrival rate increased and they developed more positive attitude towards classes. The productivity increased across both regular and special need students. In addition to concepts taught by instructor, developing self-concepts also became easier. The reasoning level of students increased significantly (Roblyer, 2006). Also, the higher the participation rate of students in technology oriented classes, higher is the average score of class. The students with lowest performance showed greater increases in scores compared to good performing students (Schacter, 2000). The impact of technology was also found to be positive on teaching behaviour of

instructors (Sang et al., 2010). Also, the results by implementing technology were better compared to other changes including reduction in class size, increasing teaching time or providing personal tutoring programs.

Negative Impacts:

In addition to positive impacts, some problems also occurred due to implementation of technology. Schacter (2000) noted that increase in efficiency is not same across all disciplines. The impact varied from student to student. The difference also occurs depending on the software usages together with level of accessible technology. The lower the grade, usage of technology produced reduced increase in efficiency (Schacter, 2000).

Implications:

It can be considered that technology has the capability to increase scores across various disciplines, including mathematics. Students' scores can increase significantly when teaching methods incorporate new technology methods as it can allow them to understand the concepts from various perspectives.

Hasselbring et al.:

Hasselbring, Lott and Zydney (2005) conducted research to discover the impact of technology on disabled students. According to them, mathematics is the course where students experience a lot of difficulties. Their research was conducted to find better means to impart mathematical knowledge to students. They implemented various techniques including implementing technology as well. According to them, various forms of technologies can be implemented including hardware and software. Hardware include teaching concepts via computers, using touch pads or using projectors while software implementation include software to present problem in a graphical way. They found that usage of technology can significantly increase students' learning capacity, keeping all other variables same. According to them, the impact of technology in enhancing computational skill needs further research (Hasselbring, Lott and Zydney, 2005).

Implications:

Hasselbring, Lott and Zydney (2005) research holds very important analysis for my study. According to their research, implementing technology can significantly improve results obtained in understanding mathematical concepts. But their research has one limitation that it is limited towards study done in disabled students only. Like the previous research done by Schacter (2000), the results are better for students whose average was below class average. Hasselbring et al. (2000) research might also be pointing at the same problem. I consider the use of technology as a key tool for enhancing the performance of students;

specifically those students who can't perform average in classroom, technology may enhance their performance providing them with alternative means of understanding course content. For instance, algebra is difficult to grasp by students, however use of technology such as fun to learn games can allow them to learn the concepts. Also, implementing technology is inexpensive compared other changes for instance improving teaching staff, spending more time or reducing class strength etc.

Leavitt:

Leavitt (2011) conducted research to discover impacts of implanting technology on the result obtained by students. A major benefit of their research to my topic is that it was based upon the same theme i.e. their research also involved study done on a mathematics class. The research was conducted on sixth grade students and obtained aid from interactive white board. It was discovered that the average marks obtained by students increased. Students spent less time to understand the problems and explaining the critical area became easier for instructor. He maintains that careful planning is critical while implementing technology. The planning must be based upon the needs of the students and the systems helpful depending on the environment must be considered (Leavitt, 2011).

Implications:

Leavitt (2011) also finds that implementing technology can enhance students' learning efficiency. Their result draws important conclusion for this research because their study is also based upon mathematics class. He provides one of the key conclusions to my research that technology has proved fruitful in teaching students in lower grade. I feel that young students unable to grasp mathematical concepts just because they were unable to understand the key concept. For example, Algebra is often a difficult concept for students. The use of technology such as use of virtual tutorials for explaining fractions can support students in learning. Suh, Moyer and Heo (2005) have illustrated the use of such technology in mathematics teaching. Additionally, I consider basics to be critical to develop full understanding of mathematics and this makes implementing technology for young students very important. Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning, (Leavitt, 2011)

Also this point out that implementation process is also critical for the success of these approaches. I find that designing the process according to students' needs together with the preferences of instructor plays significant role.

Hartsell, Herron, Fang and Rathod (2011):

Hartsell, Herron, Fang and Rathod (2011) considered the benefits of technology implementation in academic institutions. They found two different benefits leading to the same end result. According to them, on the one hand implementing technology increased student's efficiency. The technology improves their concepts and allows them to grasp concepts in a better way. But along with this, technology also increases instructor's efficiency to impact knowledge to the students. According to them, it is difficult for students to gain benefits from implemented technology if the instructor has no idea of its usage. The new implemented methods must first be guided to instructors to increase efficiency. Based upon a four week study, they found that with time, instructor learnt how new technology can be used and how it can be implemented in teaching mathematics to students. With time, the student's results are also likely to improve (Hartsell et al., 2011).

Implication:

Hartsell et al. (2011) study hold very important implication for my research since their study is also based upon study on mathematics class. Also, their study reflects an important result that implemented technology must first be taught to instructor to obtain its actual benefits. I find their research very important as I have seen instructors who were unable to teach students in an effective way just because of unawareness to effectively using technology. Even though, they had the resources available, but simply not knowing how to use them was creating this gap. By teaching the instructor about usage of technology, he will be able to learn various ways thorough which he can efficiently teach students and thus increase overall efficiency. This study holds important result that benefits from technology depends on two factors: firstly, instructor must be convenient in teaching using new technology. Secondly, students must be able to enhance concepts using the new approach.

Conclusion

It has been found that in educational institution, students face difficulty in understanding mathematics concepts. The problem is particularly acute in mathematics where I have found students unable to understand concepts, develop mental image, unable to realise how the problem can be generalised to other scenarios and, sometimes, inability of understand to make the concept clear. Implementing such technologies is not a complex process. The academic departments must first model the implementation process and find the relevant technology which can produce best results. For successful result, opinions from both teachers and students must be obtained. Such implementation approaches significantly improves students' performance. Usage of software must also go through similar processes of design and implementation. Students and instructors must be convenient with the new

methods. Instructors must be able to easily merge new methods into their teaching. By implementing technology it will become easier for students to understand key problems, develop concepts and visualize the models. These methods will make it easy for instructors to deliver mathematical knowledge. I view that such technology will help in producing better results in all fields with which mathematics is related including engineering and finance. It will help my students in understanding concepts and provide me flexibility to teach concepts using several examples. Also, teaching will become less cumbersome where teaching three dimensional models on white board is a tedious process.

Bibliography:

Chesbrough, H. 2003. Open innovation: The new imperative for creating and profiting from technology. *Harvard Business Press*, 1 (1), pp. 1-28. [Accessed: 31 Aug 2013].

Hartsell, T., Herron, S. S., Fang, H., & Rathod, A. 2011. Improving Teachers' Self-Confidence in Learning Technology Skills and Math Education through Professional Development. *Advancing Education with Information Communication Technologies: Facilitating New Trends*, 6, 150.

Hasselbring, T. S., Lott, A. C., & Zydney, J. M. 2005. Technology-supported math instruction for students with disabilities: Two decades of research and development. pp. 46-88 [Accessed: December, 12, 2005].

Leavitt, S. (2011). Interactive Problem Solving: Incorporating Interactive Whiteboard Technology with Problem Solving in the Math Classroom.

López, O. S. (2010). The Digital Learning Classroom: Improving English Language Learners' academic success in mathematics and reading using interactive whiteboard technology. *Computers & Education*, 54(4), 901-915.

Nilsson, G., & Luchinskaya, E. (2012). Do We Deliver Effective Maths Support for Students?. In *The European Conference on Educational Research 2012: Cadiz, 18-21 September 2012*.

Roblyer, M. D., Edwards, J., & Havriluk, M. A. 2006. *Integrating educational technology into teaching*. Pearson/Merrill Prentice Hall. Pp. 1-102.

Sang, G., Valcke, M., Braak, J. V., & Tondeur, J. (2010). Student teachers' thinking processes and ICT integration: Predictors of prospective teaching behaviours with educational technology. *Computers & Education*, 54(1), 103-112.

Schacter, J. 2000. The impact of education technology on student achievement. *What the Most current Research Has to Say*. pp. 1-26. [Accessed: 31 Aug 2013].

Suh, J., Moyer, P. S., & Heo, H. J. (2005). Examining technology uses in the classroom: Developing fraction sense using virtual manipulative concept tutorials. *Journal of Interactive Online Learning*, 3(4), 1-21.