Impact of Technology Integration in Teaching Mathematics among Secondary School Students

Dr. Madhu G, Principal, Kuvempu Shathamanothsava Shikshana Mahavidyalaya, Shimoga. Email:

Dr. Mahadevaswamy P, Assistant Professor, Dept. of Psychology, Karnataka State Open University, Mysore.

ABSTRACT

The problem explored in this study was whether access to technology impacted technology integration in mathematics instruction in urban secondary schools. Access to technology was measured by teacher experience. Technology integration was measured by technology use in instruction and instructional activity. The study used quantitative research. Both descriptive and inferential statistics were used to understand how the independent variable impacted technology integration. The number of computers in a classroom significantly influenced ($p \geq 37.28$) technology integration in mathematics instruction in urban secondary classrooms. The number of computers available in a classroom influenced the extent of technology integration in the mathematics curriculum in urban secondary classrooms. Teachers who have more computers in their classroom integrated technology more frequently in mathematics instruction. Recommendations from this study include the financial resources necessary for the training, support and the provision of computer technology in mathematics classrooms of urban secondary schools.

Introduction:

Early efforts by schools to computerise instruction used computers as teaching machines for keyboarding, for word processing for writing, and in mathematics classes for drill. Today, educators who advocate for the application of technology in teaching would like teachers to move beyond the use of computers for simple tasks such as drill and practice to new applications like the use of multimedia, and as a research and problem solving tool. Becker (2000) noted that "although classroom access to computers is increasing rapidly, the most creative uses of computer technology are not yet linked to curricula". Computer use in schools occurs most often

in computer classes and not in core academic subjects such as math and science. The presence of new computer technology in classrooms requires new pedagogical methods for the many and varied format of digital technologies. Computer technology can play an essential role in learning.

PURPOSE OF THE STUDY:

Accordingly, there have been efforts to get teachers to integrate technology into their instruction practices. However, this emphasis on integration has not yielded adequate results because teachers utilize technology less frequently than known to be effective, this is due, in part, because teachers' ability to integrate computer technology effectively in this new environment depends on their own knowledge about technology. As the use of computers grows in society, the lack of an instructional framework for the use of new technologies leaves teachers feeling unprepared and anxious about using computers in the classroom. For example, pre-service mathematics teachers felt that the use of technology might change the traditional role of teaching from what they experienced as students. These realities and the significant investments that are made in hardware, software, and technology infrastructure warrant a search for evidence of problem-solving instructional integration of technology in college classrooms. The purpose of this study was to analyse teacher access to technology and its impact on technology integration in mathematics instruction in urban secondary classrooms.

OBJECTIVES:

To study the influence of technology instructional activities in mathematics among urban secondary classrooms.

HYPOTHESES:

1. There is no difference in technology use in mathematics instruction for teachers with access to technology and teachers without access to technology in urban secondary classrooms.
2. There is no difference in technology use in mathematics instructional activity for teachers with access to technology versus teachers without access to technology in urban secondary classrooms.

VARIABLES:

To better understand technology integration, this study examined the independent variable which was technology access represented by the availability of computers in the class room. The dependent variable examined was technology integration represented by mathematics instructional activity

METHODOLOGY:

Survey method was employed to collect the data; researcher prepared a questionnaire to determine whether access to technology (availability, teacher experience, teacher professional development) impacted technology integration in mathematics. Both descriptive and inferential statistics were used to understand how the independent variable impacted technology integration

SAMPLING:

The study considered data from 100 urban Secondary school mathematics teachers.

TOOLS USED:

Questionnaire prepared by researcher items were used to collect data on technology availability, teacher experience, professional development, technology use, and mathematics instructional activity. The Statistical Package for the Social Sciences (SPSS) generated the descriptive and inferential statistical analysis of the current research study.

Findings and Interpretation:

First null hypothesis which states that there is no difference in technology integration in mathematics instruction for teachers with access to technology and teachers without access to technology in urban secondary classrooms. The results indicated that teachers who had computers available in their classrooms differed significantly in their integration of computers in

mathematics instruction (t=37.28, p>0.05). Teachers who had computers available in urban Secondary classrooms used computers with higher frequency for mathematics instruction.

There is a significance difference between the technology uses in mathematics instructional activity for teachers with access to technology versus teachers without access to technology in urban secondary classrooms. The second Null hypothesis which states that there is no difference in technology integration in mathematics instructional activity for teachers with access to technology and teachers without access to technology in urban secondary classrooms. The findings showed that access to technology influenced instructional activity integration in mathematics (t=12.35, p>0.05).

Discussion and Conclusion:

The number of computers and the instructional activities in the classroom need to be improved in urban public secondary schools. The researcher's personal experiences in the past suggest that access to computers for instruction can be realized in urban secondary mathematics classrooms. The physical presence of one or two computers in a classroom or a computer laboratory without support does not constitute adequate access to computer technology. Mathematics teachers need to have access to computers in their working spaces to give them the opportunity for frequent integration in their classroom instruction.

The purpose of this study was to analyse teacher access to technology and its impact on technology integration in mathematics instruction in urban secondary classrooms. Findings in this study suggested that access to technology impacted integration in mathematics. The researcher believes that the examination of access to technology and how this relates to integration in mathematics instruction in urban secondary schools will help urban schools develop a plan for technology use. This involves the development of a plan that is focused on providing urban teachers with computers in their classrooms.

REFERENCES:

- Alsup, J. (2004). A comparison of constructivist and traditional instruction in mathematics. Educational Research Quarterly, 28(4), 3-17.
- Becker, H. J. (1999). Internet use by teachers: Conditions of professional use and teacher- directed student use. Teaching, Learning, and Computing.

- Becker, H. J. (2000). Who's wired and who's not: Children's access to and use of computer technology. Children and Computer Technology, 10(2), 44-75.
- Christensen, R. (2002). Effects of technology integration education on the attitudes of teachers and students. Journal of Research on Technology Education, 34(4), 411-434.
- Conway, J. (1997). Educational technology's effect on models of instruction. Retrieved October 22, 2008, from http://copland.udel.edu/~jconway/EDST666.htm
- International Society for Technology in Education. (1998). National education technology standards. Retrieved October 12, 2008, from http://www.iste.org/nets
- Sidhu.K.S. (1998) , The teaching of Modern Mathematics,sterling,NewDelhi
- Watson, G. (2006). Technology professional development: Long-term effects on teacher efficacy. Journal of Technology and Teacher Education, 151-165.
- Wenglinski, H. G. (1998). Does it compute? The relationship between educational technology and student achievement in mathematics. Princeton, NJ: Educational Testing Services, Policy Information Center.