COMPUTER-AIDED INSTRUCTION: ITS EFFECTIVENESS IN MATHEMATICS EDUCATION

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“Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning” – National Council of Teachers in Mathematics (2000)\(^1\).

In today’s information age, different research studies emerged and recommended the use of computer as a tool for teachers in teaching mathematics. Barlis and Fajardo (as cited in Abante, 2006)\(^2\) concluded the use of computer as an effective alternative approach in teaching the traditional method. This is also supported by Aydin (2005)\(^3\), who encouraged mathematics teachers to develop computer-based lecture to be used in their respective classes.

Computer-aided instruction has been widely utilized all over the world. In fact, the Developing Mathematics Programmes (DMP) in Turkey supported the use of computer in education as it recommends computer-aided instruction (CAI) as an alternative teaching methodology that could enhance students’ mathematical skills. It advised the teachers to use a variety of resources and equipment to support classroom teaching, including technology. According to DMP’s survey, 42% of the teachers integrate Information and Communication

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\(^2\) Barlis and Fajardo (2013). Effectiveness of Simulation and Computer Assisted Instruction on the Performance of Students Under Regimental Training on Selected Topics in Physics II.

Technology (ICT) in teaching mathematics by using software for graphing and generating statistics while the remaining 58% still stick with the traditional method of teaching.

In the study conducted by Rodrigo (2009)\textsuperscript{4}, it was revealed that 71% of private elementary schools use computers for teaching while 7% of public elementary schools have ICT resources intended for teaching. Moreover, 31% of all the schools in the Philippines integrated ICT in teaching mathematics, science, and other major subjects.

Different researches and studies have been conducted to seek the effectiveness of integration of computer in mathematics education, specifically, the computer-aided instruction. Various CAI programs sprout globally to be tested and experimented in some institutions to seek its effectiveness. Different organizations recommend the use of CAI in teaching particularly in mathematics. Most of the schools worldwide used CAI as an effective tool of teaching.

In line with this, as a researcher together with my colleagues major in Mathematics, conducted a study entitled “Assessment of Students’ Performance Using Traditional and CAI in Teaching Mathematics” which focused on the performance of the Grade 3 pupils of Baliuag University. Our team assessed the teaching outcome of the traditional approach and the CAI using the designed program which we developed. The program was named Integrated Mathematical Courseware (IMC) that is intended to enhance Grade 3 students’ mathematical skills specifically in multiplication, division and fraction. The content of the courseware was designed based on the subject manual prescribed by the Mathematics Teacher of Baliuag University.

\textsuperscript{4} Rodrigo, M. T. (2009). Information and communication technology use in Philippine public and private schools.
A series of procedures were conducted to create the said program and a lot of steps were done to determine its appropriateness in Mathematics instruction. When the courseware was fully evaluated by Computer Application Developers, it was utilized in the classroom to teach the same subject content in Mathematics as used by the traditional approach in teaching the subject. Based on the result of the said quasi-experimentation, the overall achievement scores of the students between traditional and computer-aided instruction was significantly different, with test scores showing significant improvement using CAI. It is to be remembered that the two sets of students involved in the study were of the same level of intelligence, same number of male and female, and undergone same condition, specifically, time and room. The percentage of students who passed is higher in CAI than the traditional method group. In addition to this, the results of test between traditional and computer-aided instruction in multiplication, division and fraction revealed that CAI, using the Integrated Mathematical Courseware, is effective in increasing the test scores of the students based on the pre-test and posttest conducted. And as shown from the said experimentation, division is the most improved scores followed by fraction and multiplication.

These studies and experimentations conducted by different researchers, together with the result of our research, prove the effectiveness of CAI specifically in mathematics. These studies shown the usefulness of technology in the education setting in this era.