Does the Application of Instructional Mathematics Software Have Enough Efficiency?

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Abstract

Modern tools as new educational systems can improve teaching-learning procedures in schools. Teaching mathematics is one of the main and difficult components in educational systems. Informing methods is essential for teachers and instructors. It seems that did not forget usual teaching method and using software or media considered as remedial teaching. Teachers always follow dynamic methods for teaching and learning. The aim of this study is that views of students studied regard to math software and its efficiency. Twenty two girl students of 2nd grade are chosen at high schools. Through standard questionnaire and survey method, views of students are collected. Data are studied via Kolmogorov-Smirnov and one sample sign tests. The results of tests indicated that students have positive views toward co-instructional software of math learning. Therefore it seems that mathematical software can advantages for teaching and learning at high schools.

Keywords: Mathematics, software, application, efficiency, teaching, learning.

1 Introduction

New electronic technologies are considered very significant factors in formation of cultural and social contexts and new technologies require new training environment and methods for educational designing. The specialists should design learning experiences matching this situation. Applying electric technologies and combining them by students learning way related experiences would help them as following: decision making, patterning, scientific investigation, experiencing different aspects of art, solving real problems, and finally participation in most of human societies and groups. The technology refers to method, art, skill and resourcefulness. Thus, reasonable decision making about deploying of technology depends on methods cognition through which performing of tasks is facilitated. The methods and techniques are organized by used devices in society that resorting them we can cast a new form to the world (Zamani et al., 2011) [8]. Information technologies indeed help us in the social and psychological world as such we use mechanical devices in acting to interact with the environment. Educational performance and new
methods of students' participation have been created by introduction of multimedia and teaching by electronic gadgets in the education system of revolution in case of teaching. Applying modern technologies have had some merits: it increases combination of information technologies in self-study instruction. Other studies indicate that using modern technologies within traditional instructing leads to learning effectiveness: some of introduced changes in traditional instruction combined with technology can be students' viewpoint shift, increased participation and interaction, and also self-confidence (Domense, 2003 [2], Zamani et al., 2011 [8]). During current decades, the math has been of more importance on the other hand, but researches indicated that students yet ha this subject. Weakness in the basic knowledge of math during elementary and guidance school courses, anxiety and having no stimulus to learn math, having no mental and subjective preparation, and being unconscious about role and effect of it on educational accomplishment are among existing problems leading to educational loss in this field (Alamolhoda, 2004). Studying the comparison of direct teaching effectiveness to an incorporated program in several elementary schools, Stewcard (2010) found that schools applying direct teaching have had significantly better performance compared to the other group (Motamedi, et al., 2013) [5]. Today therefore the teacher as the most important resource within the education organization being unconscious about the complexity of evolutions would never be able to perform his/her serious task properly, based on this Davayer's (1998) researches indicate that teachers professional abilities can be increased by applying the information and communication technology and this would be possible when teachers are well thought how to use information and communication technology (Jaryani, 2008) [4]. A study entitled "the effects of instructional tapes of math on elementary students' development" was down by Abbasi (2004) [1] and results show that elementary students would be more successful if the teacher uses this device rather than teaching without these instructional devices (Teymori, 2010) [7]. Applying mathematic new technologies are having following merits:

- Learners receive impulsive reactions testing their ideas by computer programs that encourage them to continue and complete the research process and identifying.
- Learners took away from concentrating on them applying the technology to perform manual and graphic computations and created incentives to do trial and error procedure.
- Doing such activities expands participation rate within learners.
- The effective nature of multimedia software stimulates learners that results in performance promotion.
- Computer based devices provide high capacity of information sharing for learners and allow them to use simultaneously graphs, images and texts for better perception of their thoughts of math concepts (Domense, 2003) [2].

However we would try in this study to investigate the application approaches of math teaching software from viewpoints of students answering this question whether or not, students have positive views toward co-instructional software of math learning?.

2 The Main Kinds and Roles of Educational Media or Software

Educational tools have two categories in terms of the role of them; 1) criterion media, 2) mediating media. In criteria tools, learners have to explain, state, rebuild and determine their whatever have learned, such as using machine for learning deriving or using educational equipments for vocational and technical skills. Mediating media means that learning context or content of textbooks will be eased for learners while criteria media ease learning via practice and skills and indeed these media are in the part of learning process. Mediating media have to be out of education environment till complete the learning process. Therefore criteria media is not essential in education process but is necessary for evaluation (Sha'bani, 2007) [6].
In many schools in Iran, teachers or instructors apply the kinds of software and or media for teaching mathematics. Since almost all software is built out of country, teachers or users did not inform of them enough, then it's possible that using these tools have problems. It's possible that many mathematical contents needed to traditional teaching and given software or media cannot promote the comprehension of students. It's better that teaching-learning process in mathematics done via Fig.2:

In Fig.2, teachers have to use usual teaching method firstly, if this method has not any efficiency then they can apply other methods for improving learning mathematical concepts. Other methods can include of media or software depended on educational circumferences. Educational courses have to implement for pre or in-services for teachers, they have to inform of the details and limitations of using these tools.
3 Method, Samples and Tool

The survey method was used in order to study research questions. This is one of the data collection, data set and analysis and different studies have different methods for data collection. The survey research is a procedure in which there are a continuous actions and reactions between data and theories as well as between elementary and later analyses. The survey research isn't merely a step by step procedure rather is one which requires creativity, imaginative faculty, reconciliation, and finding proper resolutions for anticipated problems. However as a statistic population, a high school in Tehran for girls was selected through multi-step cluster sampling; this school was using electronic and software methods for educational methods and curricula. The 2nd grade high school students of math field were chosen from among different grades. Then 22 students were selected out of 100. The realized standard questionnaire was used in order to investigate this research. A standard questionnaire containing 12 items with Likert five scales was chosen relying on researches and performed questionnaire overseas which was first studied and confirmed by sophisticated researchers regarding its legitimacy following its reliability was demonstrated with Cronbach’s alpha of 0.71 after several performances. After complying, the standard questionnaire was performed within math students at the end of semester. They were asked to answer honestly and express their true opinions. This questionnaire is implemented after teaching mathematics via software.

4 Findings and Discussion

Results from realized questionnaire data were studied through Kolmogorov-Smirnov and one sample sign tests at the significance level 0.05. Results of Kolmogorov-Smirnov test showed that data aren't normal. Thus data through one sample test are analyzed. Results from one sample test with significance level 0.05 showed that students have positive view toward educational software in math teaching. Indeed this test indicated that students have positive views toward co-instructional software of math learning. These views are clear because there are reasons:

- Students could observe abstract concepts via diagrams and figures,
- Critical thinking and arguments of students are expanded with teacher,
- Practices are fantastic through applying software, and totally
- Students can practice and study mathematical problems always.

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5 Conclusion

The communication and information technology can be increased as an innovative and interested facilitator in teaching rather than being a tool. Its specifications determinations and conscious management is one of the prominent methods for officials or managers and is used as an opportunity to reform and change educational system and evolution within learning-teaching process. The education system as a renewing and economic, cultural, and social development position needs to benefit from modern information and communication technologies within educational fields. The information and communication technology development in the education needs a long term planning which can realize community needs regarding a conclusive education. We can achieve the greatest success within applications of the communication and information technology among curricula and learning procedures. We focus our sentiments and intellecction to glorify original and significant learning. We are to heighten teachers’ self-confidence and professional command how to apply modern education methods as a problem solving. If the culture of learning-teaching does not change in education system, not only the introduction of the communication and information won’t create the change but also will enrich conservative traditions in education. Because it’s not the communication and information technology that pose a change rather human change everything and human forces are the most popular element to spread and expand the communication and information technology or media. The incorporation of this technology by state education system requires accurate and conscious preparation in addition for cultural, social, economic, and technical considerations. Accession to international resources of knowledge and experiences would help this to be achieved, since organizing of it in education system requires to pass stages like transition, idea, creation, absorb and localization, and documentation. Because considering the conclusive education is one of the goals of education system, thus to realize these following scientific strategies are presented in case of the communication and information technology application in the education:

- Developing communications infrastructure and equipping schools with modern communication and information technology
- Train teachers and enrich their basic information knowledge
- Train students and enrich their basic information knowledge
- Social participation to benefit from communication and information technology in the education
- Research and plan for change
- Resources

References


