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Technology and Learning Capacity of Children: A Positive Impact of Technology in Early Childhood

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Technology and Learning Capacity of Children:

A Positive Impact of Technology in Early Childhood

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Abstract

Technology has become an indispensable part in today's era. From business to human life, people are using different technologies in the name of Computers, Tablet, Ipad, Mobile phone, T.V and so on. In the same way, the prevalence of technology ownership and use is already very high among teens and increasing among younger children. In addition, using such gadgets has become a trend in today's culture for literacy and knowledge. We can see the positive relationship between learning and technology integration in the education sector with so many benefits. However, some researchers still believe the use of technology may impede children's social, emotional, physical, and cognitive development. The fact is technology is never a culprit if we use it wisely, and it should solve the problems and fill the gap in the education system as expected. The reason is, in a real world, perfect outputs are considered to those who will be able to apply the knowledge and the skills they learned and make a better decision in any challenges faced inside or outside the organization. Therefore, the main purpose of the study is to find out the positive relationship between children's expertise and technology along with the professional judgment of the teacher to determine if the specific use of technology is appropriate individually, culturally, and per age.

Keywords: Technology use and learning, effects and controlling activities

“There is a difference between knowing the name of something and knowing something.” **Richard Feynman, Nobel Prize-Winning physicist**

Children today are born into the world where technology is deeply integrated into the fabric of daily life. The prevalence of technology ownership and use is already very high among teens and increasing among younger children. Using such gadgets has become a trend in today’s culture for literacy and knowledge. As technology becomes easier to use and early childhood software proliferates, young children’s use of technology becomes more widespread. Therefore, early childhood educators have a responsibility to critically examine the impact of technology in young children and be prepared to use technology to benefit children.

In 2013, seventy-two percent of children of age eight and under have used a mobile device for media activity such as playing games, watching videos, or using apps in compare to thirty-eight percent in 2011 (Zero to Eight, 2013). In addition, time spent using these devices has also increased by three times from five hours a day in 2011 to fifteen hours a day in 2013 (Zero to Eight, 2013). Market researchers tracking software trends have identified that the largest software growth recently has been in new titles and companies serving the early childhood educational market. Of the people who own home computers and have young children, 70% have purchased educational software for their children to use (SPA Consumer Market Report, 1996). Different schools and libraries are also in a race of making everything digitized to cope with these trends, developing learning theories and making curricula that meet the contemporary children.

Although there is a positive trend in the relationship between learning and technology integration, some researchers still believe the use of technologies may impede children’s social, emotional, physical, and cognitive development (Ozgur & Seyhan, 2010). But, if activities are

properly controlled and a wide array of technology is integrated into classroom, early childhood professionals will not be “missing the boat”. Early childhood educators must take responsibility to influence events that are transforming the daily lives of children and families. Since there is no specific study that has been conducted for comparative study of technological impact in classroom approach, the main purpose of this study is to examine how the use of technologies can enhance the learning skills in young children, teacher’s role in evaluating appropriate use of technology, and the role of teachers and parents as advocates.

Statement of the problem

Memorizing a list of facts or a list of procedures is unlikely to promote sufficient understanding of a concept for students to be able to apply it in a new situation. In a real world, a perfect output is considered to those who will be able to apply the knowledge and skills they learned and make a better decision in any challenges faced inside or outside of the organization. The real goal of the course is not only to pass the exam but to become competent, develop a broad perspective, and understand the world around us today or in near future. Digital technology can be used in order to train, assist and even in the enable learning process. A specifically designed application can not only stimulate student’s interest but may also help students with disabilities fit into and progress within the mainstream of school environment. There are various implementations of ICT in education and learning, have been researched such as the use of websites, virtual environment, computer games, implementation of portable writing aids and configurable word processing environments. Although many attempts have been done to implement technology integration into the classroom, until now, they lack to give the valid reason. “Why to integrate such technology in a learning environment?”

Even though the quality of experiences encountered by young children during the early period has a tremendous impact on their personal development and learning abilities, still some elementary schools are hesitating to incorporate the technology in learning. In 2001, the ratio of students to instructional computers with internet access in public schools was only 5.4 to 1 (Newburger, 2001). But, the present study in Gaborone shows that 67% of the current sample of reception schools of Gaborone have introduced computers in the schools, but only as a tool to be kept in the computer lab for using it once a week, mainly for computer literacy. It shows the lack of practice and reluctant to change according to current scope and demand. Due to the lack of education and proper rules, children today are still deprived from the perfect education they are supposed to get. For this reason, school today must integrate technology with proper identification of a particular program that actually helps the student in developing cognitive and intellectual skills with proper communication and interpreting skills.

Therefore, this study will address the integration of technology in a typical environment for early-aged children, the comparative study of learning in a classroom, attempts that should be done by parents and teachers to control child activities and prevent from technology abuse.

Purpose of the study

Technology is not really a culprit if we use it wisely and it also should solve the problems and fill the gap in the education system as expected. The main purpose of the study is to find out the positive relationship between children's expertise and technology and to find out the professional judgment by the teacher to determine if a specific use of technology is age appropriate, individually appropriate, and culturally appropriate. As the trend of gadgets and applications is increasing in children, it is very important to find out the best way to use these and prevent children from abusing these technologies. In future, the study can also be

implemented in higher level education and a perfect technical scenario can be generated so as to enhance intellectual and thinking skills in all level of students.

Research questions and hypotheses

The study will address the following questions:

1. How effective are the applications in enhancing efficiency in learning?
2. Are the technologies ways to go for an education system?
3. What is the essential role of teachers in evaluating the appropriate use of technology?
4. What are the implications of technology for professional development?

To conduct the study, the following hypothesis were developed

H₀: Kids learn better with technologies in the classroom.

H₁: Kids do not learn better with technologies in the classroom.

Literature review

Technologies used in education and their perception

With teaching behaviors, it is true that there is a disconnection between what is taught and what actually happens in the real world, so in order to catch up with the real world to the schools, they need to incorporate technological advances. The quality of experiences encountered by young children during this period has tremendous impacts on their personal development and learning abilities. Since devices are used in our life, it is very important to incorporate technology into learning environment.

Day by day, different applications are developed which are geared up for the small children. These applications are run with the help of technologies such as iPad, Tablet, Computer, mobile phones, T. Vs and so on. With the help of these materials, children are being able to develop their cognitive, social, emotional, intellectual, communication, and problem-

solving skills. The Albert Shanker Institute (2009) and NAEYC (2009) emphasized the significance of providing kindergarten children with a variety of developmentally appropriate practices that encourage their self-esteem, independence, identity formation, and individual strengths. Developmentally appropriate practice means that teachers shift their focus from traditional teaching strategies and move toward providing experiences that align with children's needs, abilities, and love for learning (Epstein, 2007 ; Pianta, 2003).

There are many examples so far which highlight the effectiveness and increased skills found in children because of use of such technology for education purpose. There is strong evidence linking the quality of support children receive during the early childhood years to health, the level of education and improved economic outcomes during adulthood (Camilli, 2010, Carneiro & Heckman, 2003; Chambers, 2006; Coghlan 2009; Karoly, 1998, 2005; Waldfogel & Washbrook, 2010). One of the most compelling longitudinal studies linking quality early childhood care and education to personal and professional effectiveness in the adult years was recently released by the FPG Child Development Institute (Campbell, 2012). The results of this study suggest that adults who were exposed to high-quality kindergarten education programs had more years of education and were four times more likely to have completed college compared to their counterparts from the control group.

According to the Grant (2003), "A Computers in Reception Schools-A Case of Gaborone", it is concluded that "A is not for Apple anymore. A is for Assistive Technology; B is for Babies and C is for Computer (Bose, 2005). However, despite all attempts done by researchers till now, there is still a lack of the productivity ratio that has been obtained by applying technology in classroom approach, realizations of a particular program that helps

children enhance their knowledge and also some controlling activities that teachers and parents must do to prevent their children from abusing technology.

Effectiveness of applications in enhancing efficiency in learning

Computers are intrinsically compelling for young children. The sounds and graphics gain children's attention. Different kinds of applications such as iCommunicate, MyTalk, Look2learn-AAC, EasyLexia have been developed to support children to enhance communication, interpretations, recognition, and literacy skills. The survey done by Department of Product and Systems Design Engineering, University of the Aegean, Syros GR84100, Greece (Skiada, Soroniati, Gardeli, & Zissis, 2014) on dyslexia patients about the mobile application to learn objects, mathematical problems shows that children with dyslexia concentrate and keep them focused, avoiding distraction, by targeting their attention on the device's touch screen (p. 226).

Technologies way to go for an education system

According to the fourth European Conference on Games-Based Learning, the survey done in 48 primary schools, the majority of the participant students chosen image integration as an important part of learning. Similarly, most of the participants agreed upon the importance of educational games more often in class to learn in a different way with the help of technology (Meyer, 2010).

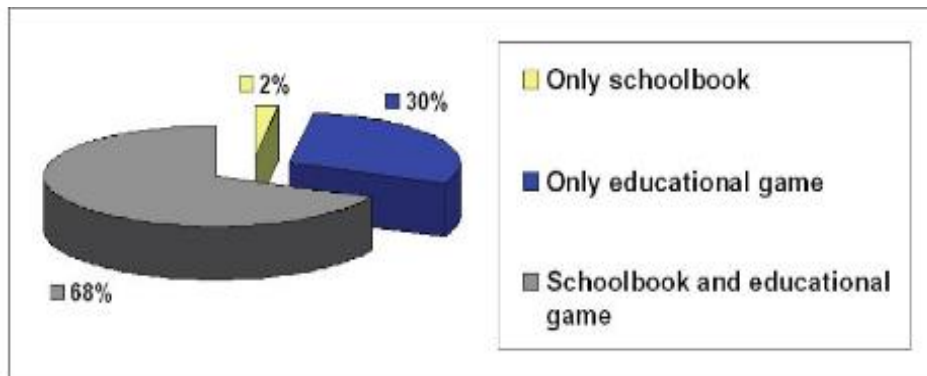


Fig1: Preferences expressed by children for different learning aids

Source: (Meyer, 2010)

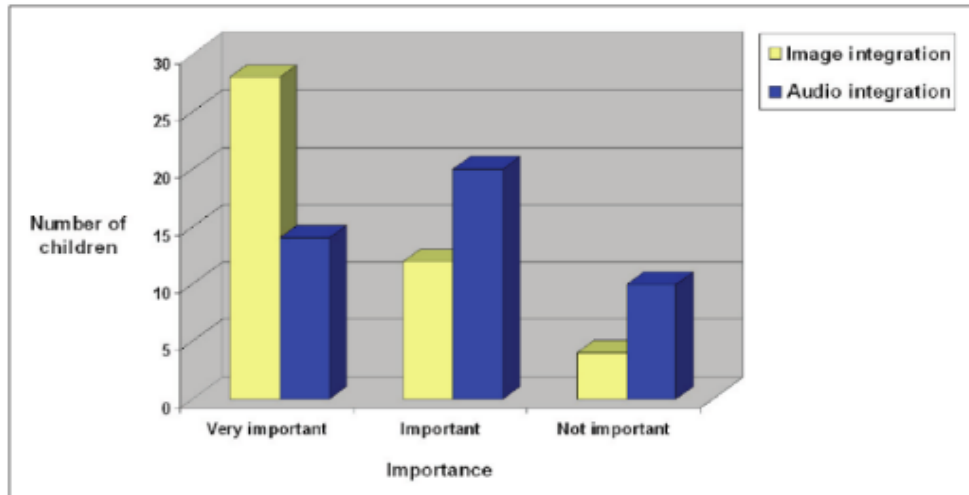


Fig2: Importance of image and audio integration

Source: (Meyer, 2010)

This research also suggests that technology is very important for the early childhood and even children have realized the importance. Therefore, if used under control, technology has lot more positive impacts in the children's future.

Essential role of teachers for selection of appropriate technology

The appropriate and beneficial use of technology with young children is ultimately the responsibility of the early childhood educator. Teachers need to make better choices as consumers. As they become educated on the appropriate uses of technology, teachers are more likely to make informed decisions and to make it known to developers of technology when they are unhappy with products. In order to select the suitable technology for the curriculum, teachers can do following practices:

- Firstly, a teacher must be familiar with the technology use so they can guide their children properly.
- Before using any applications, they must check and evaluate the benefits of using applications in children.

- Determining the applications that are suitable for all aged, gender, raced and cultured people.
- Making a decision based on the student's ability, available budget and feasibility of time.
- Encourage software publishers to make previewing of software easier for parents and educators.
- Encourage software publishers to develop programs that reflect appropriate, nonviolent ways to solve problems and correct mistakes.

Implications of technology for professional development

To achieve the potential benefits of technology, both pre-service and in-service training must be provided to early childhood educators with opportunities for basic information and awareness. These efforts must address the rapid proliferation and fast-paced change within the technology arena. Teachers must be well-trained so that whenever the children ask any questions they should be able to answer correctly according to the child's understanding. They should obliterate the misconception regarding technology use so that children also can learn and use technology at home without any boundaries under the parent's regulations. So, that in near future, they will be able to develop problem-solving, cognitive, and communication skills.

Methods

Research design

The objective of this research is to measure the learning capacity of students with the help of technology in education system along with finding out the effective way to use such technologies in near future. The fundamental source of which the data/information recovered will be the on-field survey. To obtain the primary data, children from elementary school of age 5-10 will be divided equally into two groups. "Group-One" will be given opportunity to use any

electronic devices to learn alphabets, words and solve mathematical problems whereas "Group-Two" will be taught in a formal way (i.e. traditional blackboard-learning method) to understand and solve mathematical problems and learn basic words. Two groups will be closely examined for six weeks and before and after the test is done. The performance will be evaluated on the basis of how quick they are in thinking, solving and interpreting the geometric shapes, order the jumbled word, do simple addition/subtraction calculations and describe given particular topic.

Sampling and data collection

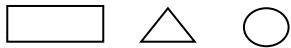
Sampling will be done randomly by choosing two schools i.e. one attempting to integrate technology in the learning environment and another one who still believes that traditional teaching is far better than a new trend. Prior arrangements shall be done with various target schools to ask permission from their parents, school's faculty members and even from the children who are willing to participate. All the needed resources will be allocated to complete the study smoothly. The researchers shall visit each school to agree on the specific day and time for the survey by undertaking the consequences and following the rules strictly. The aim of the study is to reach at least N=30.

Instrumentation

The question shall use English as a common language for all participating children. The collected data will be both qualitative and quantitative. In the first step, for the primary data, all the random (from same grade and disregard of age) participating children's I.Q. level, intelligence, and capability will be measure by showing some animals pictures, their proficiency in saying the words and interpreting the knowledge. The result will be measured by using Likert Scales 1) Highly intelligent, 2) Intelligent, 3) Normal, 4) Weak, 5) Very weak) which will help to differentiate the progress from pre-to-posttest. After that, parents would be interviewed about the


behavior their children show at home while using technology such as their willingness to learn and availability of such technology at home. The second step will be dividing the group equally and giving computers or Ipad to one group to learn more about geometric shapes, learn to pronounce specific words, and learn about simple calculations in mathematics while the second group will be taught the same thing by a teacher in traditional blackboard approach.

The question asked will be an objective question. The sample question will be as follow:




1. What are the names of these shapes?
2. What comes between? F_O_E_ [ans. FLOWER], Z_B_A [ans. ZEBRA]
3. Pronounce the words such “ELEMENTARY”, “SCISSORS”, “STETHOSCOPE”
4. Describe about “DOG” and “PLACES YOU LIKE TO VISIT AND WHY?”
5. Add “2+3”, “3+4”/ Subtract “5-2”, “3-1”

Circle the correct answers

1. What is this? 

a. Triangle b. Square c. Rectangle

2. What is this? 

a. Triangle b. Square c. Rectangle


3. 2+3=


a. 6 b. 5 c. 8

4. 8-3=

a. 3 b. 5 c. 6

Complete the word

1. S_A_ 

2. M_O_ 

5. Tell about “DOG”

6. Tell about the “Beautiful place you would like to visit”

7. Say these words loud “CALCULATOR”, “BINOCULARS”, “AMBULANCE”, “ANIMAL”, “SCISSORS”

Fig3: Sample question Format

Data analysis and procedures

After collecting all the primary and secondary data and all the procedures are applied, the researchers will perform the statistical tests using standard $\alpha=0.5$. The researchers will compute the mean age of the children. It is important that the age of the children will be evenly distributed because the percentage of each age group in two different schools, educational level, environment, and ethnicity will be computed.

The independent variable in the study is the use of technology whereas dependent variable is an improvement in knowledge and literacy in education. The researcher shall use the Pearson-product moment correlation coefficient as a statistical test. Because two hypotheses in this study focus on whether two variables are significantly correlated; the test will evaluate whether there is a relationship between two variables or not. The rest of the research data will be analyzed using different statistical tests.

Summary

To outline, only theoretical knowledge is not sufficient to learn. To have a better understanding and to apply learned knowledge and skills in the real world, children must be perfect and have practical knowledge side by side. For that, from the early age, they should get the freedom to know, learn and explore everything and this is only possible from the technology integration. Therefore, this study aims at providing benefits of technology in the class room as well as defines the evidence to support it. Furthermore, this study also provides the teacher's roles in choosing and applying technology in learning as well as different kinds of development skills children can build in them with the help of such technology.

Limitations of study

This study will try to include all the data and information as far as possible to conclude the result. But still, it has some limitations. The sample size included in this research is limited. Only two schools are included so far in coming to the general conclusion. It has not included parent's role in children such as proactive or passive role. The study duration is only six weeks which is also a short time to drive the conclusion.

Conclusion

To conclude, this study highlights the potential benefits of technology for children especially in learning needs. It focused on designing curricula for early children which is directed at improving children's fundamental learning skills through the use of advanced technology. After the completion of the research, the researcher will be able to identify whether the integration help to increase the efficiency, productivity, and capability as expected.

However, the policies of using technology in elementary schools are made, for the implementation, different factors such as availability of budget, the willingness of faculty members to change, benefits and the effectiveness of the change play a vital role. Moreover, different controlling mechanisms for technology abuse should be identified and the perfect and appropriate technology should be implemented before applying the change.

Acknowledgement

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