The Effects Of Two Different Instructional Programmes On Literacy Skills Of Kindergarten Children

Dr. Nahla M. Gahwaji, Ph.D., King Abdulaziz University, Saudi Arabia

ABSTRACT

Lately, research exploring the effects of tutorial instructional programmes and educational games on literacy skills of kindergarten children has attracted large number of educational technology researchers and practitioners. Even though overwhelming research literature on the subject is available, the majority of this existing work is designed and organized in western contexts i.e. developed countries. Due to that reason, much less is known about the effects of tutorial instructional programmes and educational games on the literacy skills of Arabic speaking kindergarten children. Our study tries to bridge this gap in the existing literature by performing a comparison study of two different instructional programmes on the development of literacy skills amongst 5 to 6 years old kindergarten children in Saudi Arabia. As a result of this study, it was found that educational games were more effective in supporting and facilitating literacy skills of participating kindergarten children compared to tutorial instructional programmes.

Keywords: Tutorial Instructional Programme; Educational Games; Literacy Skills; Saudi Kindergarten

INTRODUCTION

Beginning of this new millennium has witnessed the transformation of traditional forms of teaching and the instruction, which has been traditionally centered on blackboards and chalk pens (Astin, 1984; Montessori, 1912). The transformation of the traditional forms of instruction into the modern form of teaching is possible due to the introduction of instructional programmes (Singh, 2003; Friedland et al., 2007). Furthermore, rapid inclusion of computing tools and techniques into the mainstream educational instruction has also contributed towards this transformation (Gibbons et al., 1997; Singh, 2003). Instructional programmes are considered essential and competent for presenting new and old concepts related to the literacy skills to the kindergarten children (Lankshear & Knobel, 2003). It is commonly believed that the instructional programmes meet the urgent necessities of children at all stages of the educational system (Lankshear & Knobel, 2003). Instructional programmes are undoubtedly considered as supporters and facilitators of the educational process (Haugland, 1999, 2000). Due to this, educators are increasingly adopting various forms of the instructional programmes in order to achieve the pedagogical needs of the young children (Sugar et al., 2004).

Lately, educational pedagogy and the instruction have witnessed a growing inclination towards learner-centric pedagogy by replacing the older known teacher-centric pedagogy (Johnson et. al., 1998). Due to this transition, the current focus of different forms of educational technologies is on the learner-centred approaches i.e. young children are considered more important than ever in the different spheres of educational technology (Rogoff et al., 1984).

The requirements related to age have direct impact on the educational process for-example, during early childhood; literacy skills of young children require special attention for their development (Evans, 2000; Whitehurst & Lonigan, 1998). Due to this reason, development of young children' literacy skills should be considered and emphasised from early years of instruction (Whitehurst & Lonigan, 1998). Lately, it has been found that use of instructional programmes have positive impact on the learning process (Turbill, 2001) as it motivates the children to learn and acquire various new educational skills (Plowman & Stephen, 2005).

Computer assisted instruction organized through the use of interactive images; visuals, texts, videos, audio, games and visual instructions were found effective at engaging the children towards learning and classroom instruction in comparison to instruction through plain text (Plowman & Stephen, 2005). There are several types of computer assisted interactive programmes, having one common goal, i.e., to motivate young children towards learning and increase their confidence (Condie et al., 2002). These computer assisted instructional programmes are commonly referred as "Instructional programmes" that tend to promote active involvement of the young children into different forms of learning (Condie et al., 2002).

One common form of computer assisted instructional programmes used at kindergarten schools is called Tutorial Instructional Programme (TIP). The purpose of TIP is expose children with newer literacy content and to assist children to follow on-screen instructions and even watch short instruction videos, whereupon the child does the tutorial exercises and receives feedback depending on his or her actions (Plowman & Stephen, 2005). The TIP is based on the patterns of educational programmes tutoring where scientific concepts are presented in an entertaining fashion through the use of images, examples, exercises and interactive instruction while providing feedback and reinforcement. This feedback is essential for constructive learning among young kindergarten children (Rendon, 1994). Young children gain knowledge through experiences, classroom instruction and self-teaching (Montessori, 1912; Vygotsky, 1978). The TIP includes pre-test, post-test and various learning enhancing activities. It guides the children throughout learning process from the beginning with brief objectives to the end i.e. evaluation phase.

Other popular form of computer assisted instructional programmes is the educational game programme, where children learn through play (Gahwaji, 2007). The educational game programme is designed to teach and assist the children in learning literacy skills while they play (Prensky, 2006). Educational games programmes are known for drill and practice based learning approach where young children play games and at the same time learn newer skills by practicing and experience (Prensky, 2006). Additionally, educational games programme promote and emphasize experimentation, trial, discovery and conclusion of the given tasks, which in a way constitute the essence of kindergarten activities (Kirriemur & McFarlane, 2004). Similarly, (Kiili, 2005) emphasized that children simply keep on experimenting with actions until their scores improve while playing an educational games programme. Educational games programme are often designed with specific curriculum objectives in mind (Royle, 2008). Furthermore, educational games programmes are developed to support the practice of factual information (Royle, 2008) therefore, educational games programme provide an appealing context for engaging children in activities that deliver literacy concepts and customized feedback (Prensky, 2006).

Earlier work on educational games programme has revealed that the usefulness of educational games is reflected in the learning of children in their early childhood (Campbell et al., 2002). Therefore, educational games programmes are central in the day-to-day activities practiced in kindergarten schools. Educational games programme help children to focus on the activities of self and develop a strong affection for the process of experimentation, and even encourage children to use their senses in learning and acquisition of experience (Amory et al., 1999). Furthermore, educational games programme do comply with the principle of compulsion and coercion, and advocate the application of flexibility, creativity, innovation and inclusiveness in the kindergarten schooling (Prensky, 2001; Silvern, 1998).

The main motivation of this study is to examine the potential effect of two different instructional programmes i.e. TIP and educational games programme on the emergent literacy skills of the kindergarten children in Saudi Arabia. Marie Clay first used the term "emergent literacy skills" so as to describe how young children interact with books and perform reading and writing (Clay, M.M, 1966). However, the more formal introduction of the term was later defined by (Teale and Sulzby, 1986). Although young children could not read or write in the conventional sense but at-least interact with the textual and pictorial content of the books. A large body of existing research on this subject is available from different fields of research including psychology, child development, educational research, linguistics and sociology. Emergent literacy is a gradual process that takes place over a time including the time of child's birth till he or she is grown to a stage where he/she can read and write in a conventional sense. In this study, we define the term literacy as the interrelation between several different parts of language including speaking, listening, and reading, writing and viewing. However, the present study will deal will all aspects of language except writing part since two instructional programmes does not support writing activity.

This research study is practiced in context to the recent initiatives of Ministry of Education (MOE), Saudi Arabia. MOE has taken a decisive step towards the introduction of computers in public schools in the late 80-90's of last century. In the beginning, public and private kindergartens opposed this introduction in the traditional forms of educational instruction and pedagogy. However, after much effort, rigorous and serious steps in the computerisation of education and the administrative system, the beginning of the 20th century has witnessed the emergence of computers in the various educational institutions including kindergartens in Saudi Arabia (Ministry of Education, 2002). Nowadays, computers are widely accepted as an educational tool. Some of the salient policy decisions by the MOE related to kindergartens include mandatory computer lab per school or at least a couple of computers where children can take lessons related to their daily instruction. In addition to this, computers for kindergarten staff so that they can prepare their lessons and worksheets using variety of the software.

At present, scientific studies investigating the potential impact of instructional programmes on the literacy skills of the Arabic speaking kindergarten children in context to Saudi Arabia are scarce (Gahwaji 2011). Furthermore, even in other parts of the world, particularly developed world, and this research problem has not received an adequate attention by researchers working in the field of the early childhood (Plowman, 1998; Plowman et al., 2002). The majority of previous studies in the Arab countries and the Gulf States in particular focused on comparing computer-based learning with the traditional methods of instruction i.e. teaching via blackboard and chalks, giving lecture in classroom and written homework and no involvement of any sort of technology for instruction in classrooms. Therefore, our present study tries to bridge the gap in the existing literature on early childhood studies. In our present study, we have performed the comparison study of two different instructional programmes in the development of literacy skills of kindergarten children in Saudi Arabia. A total of 41 children from local kindergarten schools and having age group 5 to 6 years participated in this research.

The rest of paper is organized as follows: Section 2 presents the background literature on use of instructional programmes for improving the emergent literacy skills of the kindergarten children. In section 3, the study setup is briefly discussed by covering topics including the research questions and the research hypothesis, the study participants, material and tools used during the study, the research methodology, the study design and process, ethical considerations and finally considerations for the reliability and validity of the study. Section 4 and 5 presents the study results and the study recommendations for other practitioners and researchers in early childhood studies. Section 6, briefly covers various limitations of the present study. Finally this paper concludes in Section 7 after presenting the future work agenda governing this research topic.

BACKGROUND LITERATURE

With the advent of instructional programmes, there has been a growing emphasis on their exploitation for various daily kindergarten activities. Instructional programmes are undoubtedly recognized as the much-needed scientific instruments having enormous capabilities for developing skills of young children. However, this growing need for the instructional programmes also requires scientific examinations on producing specific design patterns for their development (Nechita & Timofti, 2011). Since this study is based on the evaluation of two instructional programmes namely TIP and educational games programmes, therefore most of the discussion presented in this section is oriented around these two instructional programmes.

Educational games programmes are known for developing critical thinking and creativity among young children. Additionally, educational game programmes are known for promoting the interests of children, help them in retaining information for longer, improve their learning experience and act as an aid in day-to-day decision making (BECTA, 2001). Educational games programmes are effective in increasing the existing capabilities of any children e.g. by strengthening the capability of any child to discover, follow up, and focus on new opportunities for self-learning (Fomichova & Fomichov, 2000). Aforementioned facts are based on different scientific examinations carried out by world researchers along with Kindergarten children in different countries.

Wood and Bennett (2006), carried a study with British primary school children at the age of 4-7 years that examined the impact of educational games on the thinking and mental processes of developmental age. This study found that children who participated in an educational game based on the concept of building ship were able to explain several interlinked concepts related to ship building at the end. Furthermore, study results have shown that educational

games promote learning through play and facilitate critical thinking among kindergarten children. Therefore the study results also have educational policy level implications i.e. kindergarten instruction could be enhanced by involving instruction oriented towards experimentation and solving problems through play. Earlier studies have also supported the fact that educational games promote the spirit of innovation and creativity among young children.

(Labbo et al., 2000) designed an educational games programme for facilitating the thinking and innovation development among kindergarten children in contrast to standalone computer game designed for entertainment and play. The study sample consisted of three groups, where each group consisted of 20 children from 10 kindergarten and 10 elementary school children. First group tested educational games programme designed for developing innovative thinking among children, second group tested computerised entertainment game (standalone application) and third and last group received instruction through traditional form of teaching and instruction as in ordinary kindergarten schools. The study results strongly favoured the educational game programme for promoting innovative thinking and critical learning among kindergarten children compared to two other alternatives i.e. traditional classroom instruction without the use of any sort of technology and computerised entertainment game. Furthermore, on comparing second and third group, it was found that both groups did not showed any significant differences in the achieved learning. Interestingly, the study results have projected that same learning related achievement was recorded in case of computerised entertainment game and traditional classroom instruction.

Kirschner (2002) investigated the effect of the different types teaching using instructional programmes on learning of kindergarten children. The study was carried out on first grade students involving instruction on basic mathematics. The study sample consisted of 41 participants and was divided randomly into two groups of 21 and 20 students. The first experimental group of 21 students was instruction through TIP while second group of 20 students received instruction through educational game programme. In conclusion of the study, it was found that results favoured learning achievements from educational games programme. This shows that educational games programme was more effective in learning related achievements if compared with TIP. This study results complements the findings of our study as well as the results given by Labbo et al., 2000.

Segers & Verhoeven, 2003 examined the effectiveness of the TIP over traditional practices of instruction in promoting reading skills among kindergarten children. The study consisted of two groups of kindergarten children (both native and migrants in the Netherlands) over an extended period of two years. The experimental group consisted of 67 children, who were given classroom instruction using a tutorial programme, twice a week for 15 minutes. This exercise was repeated over a period of 15 weeks in two years. The second group was a control group that consisted of 97 children who were instructed using traditional approaches of instruction on reading skills. On comparing the final results, it was found that the TIP, performed better compared to traditional instruction on enhancing reading skills. Furthermore, study also concluded that TIP had positive impact on the teaching curricular of the participating kindergarten.

Ayvac & Deveciolu, 2010 compared traditional forms of instruction with TIP for promoting reading and writing skills among kindergarten children. The study sample consisted of 36 kindergarten children in Turkey. Ayvac & Deveciolu, 2010 study is different from that Segers & Verhoeven, 2003, since Ayvac & Deveciolu, 2010 focussed on supporting both writing and reading skills among kindergarten children, in contrast to only reading skills. All participating children were randomly divided into two equal groups namely experimental and control group. The experimental group was instructed using traditional classroom instruction while the control group was taught using TIP. After the experiment, all participants were subjected to personal interviews, in order to understand the differences in learning between the two groups. It was found that the control group, where instruction was performed using TIP, was more effective in contrast to the group that received instruction from traditional classroom instruction. Therefore, this study results, complements the findings of the studies carried out in other parts of the world example, study results of Segers & Verhoeven, 2003.

Nikiforidou & Pange, 2010 conducted a similar study involving an educational game programme titled “shoes and squares”. This game programme relied on the guesswork, where students have to choose the card with the box of the given shoe fitting. The score was calculated for each of the participating child. In the end of experiment, it was found that children learn if they are allowed to take decisions independently and precede ahead based on guesswork. Therefore, study results show that if a child is allowed to independently experiment and play the game and it has

better chances to learn as the process of guessing proceed with in built feedback of the game. The study results are also in accordance with the postulates of developmental theory, which argue for providing hints, independence and trial to promote learning among children.

Aghlara & Tamjid, 2011 evaluated the impact of educational game programme over the traditional classroom instruction on teaching English vocabulary to kindergarten children in Iran. The study consisted of 40 participants, aged between 6-7 years, divided equally and randomly into two groups namely experimental and control group. The participating children did not had any prior experience with English teaching hence were not familiar with English language. The results showed that instruction via educational game programme outperformed the traditional classroom instruction methodology in terms of teaching English vocabulary.

Gahwaji, 2011 presented a case study that explored the effects of using interactive instructional programmes on literacy development for kindergarten children. The participants of the study consisted of 38 kindergarten children from three different classrooms within a single private school located in Jeddah, Saudi Arabia. The study results found interactive instructional programme as effective in increasing word acquisition, oral language, and written words.

In the next section, our study related details have been discussed in both length and breadth. The study set up behind this study has been explained covering discussion on the research questions of the study, information on study participants, different material and tools used in the study, research methodology behind the study, study design and process, various ethical considerations practiced in order to ensure our compliance towards various ethical standards and finally considerations for ensuring validity and reliability of the study are covered.

Research Question

To examine which out of two, TIP and educational game is more effective in supporting the emergent literacy skills of kindergarten children in Saudi Arabia. This research aims at investigating if there is a difference in children's acquisition of literacy concepts between TIP and educational games programme. The independent variables in this study are two instructional programmes i.e. TIP and educational game while dependent variable is literacy skill assessment test.

Research Hypothesis

Our study had an underlying hypothesis that "there is no statistical significant difference at the significance level (a =0.05) in the literacy skill assessment test due to the difference in instruction as one group was taught using TIP while other from educational game programme".

Study Participants

The study participants were chosen from a private kindergarten affiliated with MOE, which was located in the city of Jeddah, Saudi Arabia. A total of 25 children (5-6 years) from this local kindergarten school participated in the pilot study while, a total of 41 children of same age group participated in the actual study during the academic year 2010/2011.

Material and Tools Used

The study consisted of two different tools namely TIP and educational game programme that were used to test the hypothesis of this study. A local company was contacted that specializes in the development of instructional programmes and educational games programme in Arabic. The instructional programmes and educational game programme provided by the local company where complaint with the teaching curricula of the chosen kindergarten school. This local company provided a list, containing TIP and educational game programmes solely for the purpose of academic research. Based on our original request, this local company provided us list of different TIPs and educational game programmes, in order to choose one TIP and one educational game programme. In order to choose suitable instructional programmes, a selection criterion for decided. Our selection criterions were: 1) TIP and

the educational game programme must involve presentations of teaching literacy concepts for kindergarten children. 2) TIP and educational game programme must involve concept presentation so as to enhance the literacy skills of the young kindergarten children. 3) The selected TIP and educational game programme are in accordance to the children's development stages at the kindergarten level.

The author of this study prepared a list of design considerations on the development of educational game programme for the local company, responsible for its design and implementation. These two main design considerations were: 1) mapping a particular literacy concept with the most appropriate media, so that concept can be concretely presented to the children. 2) Placing the educational content as the core part of the game, so that children learn literacy concepts and perform critical thinking while playing the game. 3) The game should involve feedback and hints, therefore feedback and hint structure should be cautiously designed so as to fully support and scaffold children with challenging content. 4) Developmental theory was decided as the guiding principle for the design of these instructional programmes.

After the selection of required TIP and educational game, the author of this paper prepared a comprehensive literacy skill assessment test based on the selected programmes. This skill assessment test was prepared based on literacy skills that were included in both instructional programmes i.e., TIP and educational game programme. This skill assessment test was evaluated and examined by the officials from MOE and teachers of the participating kindergarten. During this phase, the skills assessment test was updated based on the feedback and suggestions given by the MOE officials and kindergarten teachers. Finally, the skill assessment test contained 25 questions, which enable us in evaluating the literacy skills of the participating children. The literacy skill assessment test included questions on various literacy concepts that were introduced through either TIP or by educational games programme. Some of the notable literacy concepts were: letters, words, rhymes, missing letters and pictures without names (so that children recognize the word from the picture). The literacy skill assessment test was specifically designed and organized to assess the child's ability to recognize letters by shape and phonics.

Research Methodology

The research methodology of this study is influenced from the quasi-experimental philosophy in which study participants were randomly divided into two separate groups namely experimental group and control group. Our choice for quasi-experimental methodology is based on the fact that main research question of this research is to examine which out of two, TIP and educational game programme is more effective in supporting the emergent literacy skills of kindergarten children. Due to the very nature of our main research question, it was decided to follow quasi-experimental methodology, where participating children were randomly divided into two groups where one group studied via TIP while second group used educational game programme for their literacy skills development.

Study Design and Process

The design of the research study and related process is divided into several phases and in this sub-section, each of those phases is explained in detail. 1) In the first phase, our research team paid a visit to the selected kindergarten in order to make necessary observations related to computer hardware and software needs, and selecting the required sample of participants. This initial visit was important to evaluate the software and computer hardware related infrastructure of the participating kindergarten since it was required to run the instructional programmes. 2) After our first meeting, kindergarten informed us about the participating teachers so we gave those participating teachers, training on using both the instructional programmes 3) After the training, pilot study was performed where the entire study setup was pre-tested with 25 participants i.e. age 5-6 years children from the same kindergarten school. During the pilot study, trained teachers were also present just to observe and monitor the study process and even provide any required help if any troubleshooting with the instructional programmers is required. 4) The collected data from the pilot test was statistically tested so as to ensure the validity and suitability of the study and its setup. 5) After a gap of few weeks from the pilot testing, actual study was organized with 41 participants of the same age group and from the same participating kindergarten school. The original study sample consisted of 46 children but 5 children were excluded from the study because of absenteeism during the experiment. The kindergarten was equipped with a computer lab and a computer corner in each classroom.

Throughout the study, the research team received much cooperation from the administration staff and teachers. All participating children were randomly divided into two experimental groups namely - first experimental group consisting of 21 children that have learned literacy skills through TIP, and the second experimental group of 20 children who learned using educational game programme. The researcher randomly picked the children for both experimental groups. Both groups received teaching lessons for next 8 weeks from their class teachers by practicing one out of two instructional programmes. During these 8 weeks instructions, class teachers and school made sure that participating children were only exposed to one or the other instructional programme.

Each of the two groups of children had an access to a specialized designed computer corner. This computer corner contains computers with either TIP or educational games programme installed. All participating children received the instruction via either TIP or educational games programme in these specially designed computer corners. Respective class teachers supervise the instruction of the participating children and recorded time spent by each participating child on the instructional programme. On average, each child spent one hour weekly on the appointed instructional programme i.e., either TIP or educational instructional game. Additionally, it was ensured that every child's activity on instructional programmes was monitored and tracking using a unique identifier number assigned to each participating child.

After 8 weeks of instruction, author of this study performed literacy skill test with all the participating children from both groups except two children who were absent on the test day so they took test on the very next day.

The author designed the literacy skill assessment test after considering the literacy concepts taught via two instructional programmes. This literacy skill assessment test was hosted on the computers in the form of a standalone computer programme so that it will appear similar and inline with the concepts introduced to the students via either TIP or educational games programme. The content of the literacy test was same for children who were instructed with TIP and educational games programme. During the design of the test, development theory was taken into consideration; therefore entire test is centered on the postulates of development theory. For-example, skill assessment test involved continuous reinforcement and hints, which were provided to children so that they can easily go through the test and even re-call, taught concepts. The literacy skill test was computerized and every child spent 15 minutes in the computer lab in the presence of a teacher and author of the study.

Ethical Considerations

Due to the fact, that our research study comprises of minor participants i.e., children below 18 years of age, study has to deal with various sensitive ethical issues such as informed consent, anonymity and confidentially of the collected data. The detailed processes practiced in context to ethical considerations for the present study are explained as follows: 1) First an official letter was send to the MOE requesting the permission to conduct the study in the selected kindergarten since the selected school was affiliated with MOE. Along with the information letter, all necessary documentation related to the study process, research questions and objectives, official documentation on the TIP and educational games programme was provided to MOE. 2) Based on our request for research, MOE issued an official letter-stating acceptance of study request and full cooperation from MOE to study researchers. 3) The acceptance letter received from MOE was later submitted to the kindergarten school principal that gave us permission to organize our research with age 5-6 year children. We did not seek any sort of approval or permission from the parents of the participating children since every parent as to sign an agreement with the school at the beginning of each year which grants permission to the school for participating in any sort of research activity. Due to the presence of such agreement with the school, children from the school can participate in any research study as long as the MOE has given a due approval. 4) In order to ensure the anonymity and confidentiality, the author of this paper was required to sign an official document stating various responsibilities in regard to ensuring confidentially of collected information. Furthermore, author of the study was under legal binding agreement, which prohibits using the collected information for purposes other than what has been authorised by MOE and school, revealing names of study participants or the identity of the participating kindergarten. This official signed document is one of the several requirements needed by MOE to give approval to any researcher to conduct any research studies in their affiliated schools. 5) After collecting the data and processing the study results, MOE requires a copy of the final written academic paper produced based on the research study. All these steps ensured that the study complies with various International and national guidelines on the ethical consideration.

Apart from the aforementioned ethical considerations, one major ethical issue faced by the researcher was to ensure if it is ethical to give one set of children a different educational tool to another. The author paid special attention to this obvious ethical concern, and this issue is explained as follows: 1) all participating children were not deprived from the opportunity of learning since all students received teaching lessons from teachers on various literacy concepts including letters recognition, rhyming, etc. from one or another instructional programme.

Reliability and Validity Considerations

The outcome of any research study is affected if the study variables are controlled and/or the experiment was not controlled. In the present study, the author was already aware that there are many variables related to the study experiment, which cannot be controlled such as children prior skills, parents support to children in the form of instruction after school, differences in the support received from teachers as it might be possible one class teacher is more skilful compared to another. Due to this reason, it was decided to focus on only two variables, which were TIP and educational computer games (independent variables) and literacy skill assessment test (dependent variable). So after 8 weeks of instruction by the class teacher, we controlled only one variable that each group received instruction using one of the two instructional programmes i.e. TIP and educational games programme.

STUDY RESULTS

The actual study was organized with 41 participants from a private kindergarten school located in the city of Jeddah. The participating children received 8 weeks of continuous instruction through either of the two instructional programmes i.e. TIP and educational games programme. After 8 weeks of instruction, all children took part in the literacy skill assessment test prepared by the author. All participating children took part in the literacy skill assessment test two times during the entire study. In order to verify the equivalence of the two groups (21 and 20 children) on the basis on the prior knowledge participating children possess on the taught literacy concepts, two tests were performed.

By conducting skill assessment test twice; we aimed at calculating the reliability of the literacy skills assessment test. We also calculated the Pearson's correlation coefficient for our literacy skill assessment test and found that the value of reliability coefficient was 0.87, which is considered appropriate value for the purpose of this study.

First Skill Assessment Test

In the start of the study, all participating children were given the literacy skill assessment test as a pre-test. The mean and standard deviation for the test scores were calculated as TIP group (M=11.619, SD=3.154) while educational game group scored (M=11.550, SD =2.929). Afterwards, t-test was conducted to detect the differences between two groups of children. As a result of the t-test, it was found that there is a lack of statistical significant different at the level of significance (a=0.05) as the calculated value for the "*t*" was 0.073. Other calculated variables were "*degree of freedom (df)*" as 39, "*critical t value*" as 2.45 and *"Significance A"*= 0.943. This clearly shows that two groups of children were equal in terms of the prior knowledge they possess about literacy concepts (to be taught during next 8 weeks instruction).

Second Skill Assessment Test

After eight weeks of instruction (TIP and educational games programme), both groups again participated in the literacy skills assessment. After the analysis of the second test scores, it was found that TIP group scored M=24.95, SD =2.25 in contract of educational game group which settled at M=28.40, SD = 1.64. These study results clearly shows that group who received instruction through educational game programme better scored compared to TIP group in the literacy skills assessment test. Similarly if the results of the first literacy skill assessment test (organized in the beginning of the study) and literacy skill assessment test second (organized after eight weeks of the instruction), it was clearly found that participating children shown progress in learning of newer literacy concepts and even their academic performance has also enhanced.

Co-Variance Test

The co-variance test was organized based on the scores of the literacy skill assessment test. This test was much needed since we aimed at detecting the individual differences among calculated scores of the two groups i.e. TIP and educational game programme. In addition, a computational analysis of variance was used to neutralize the impact of pre-test (organized in the beginning) and that of re-test (organized after eight weeks). The results of this analysis were as follows: In the source of variation as pre-test, it was found that "*sum of squares"* = 56.677, "*df*"=1, "*average squares = 56.677*", *"calculated p value = 22.653", "Critical p value =5.42"* and *"significance" = 0.000*. Similarly when the source of variation was instructional programme, it was found "*sum of squares"* = 123.681, "*df*"=1, "*average squares = 123.681*", *"calculated p value = 49.433", "Critical p value =5.42"* and *"significance" = 0.000*. The error was calculated as "*sum of squares"* = 95.075", "*df*"=38, "*average squares = 2.502*". The total value for "*sum of squares"* was found as 273.512 and "*df*"=40.

These study results have shown that there exists statistically significant difference (significance $\alpha = 0.05$) on literacy skill assessment dimension between the two experimental groups. This difference was in favour of the group that learnt using educational games. The calculated *p value* is equal to (49.433) while the critical *p value* is equal to (5.42). Our study had an underlying hypothesis that "there is no statistical significant difference at the significance level (a =0.05) in the literacy skill assessment test due to the difference in instruction as one group was taught using TIP while other from educational games programme". Based on our study results, this hypothesis stands incorrect.

The results presented above clearly show that student group which was instructed through educational games programme performed better compared to the other group instructed through TIP.

STUDY RECOMMENDATIONS

Our present study concluded with recommendations and guidelines for the different institutions including both public and private kindergarten schools, teachers and instructors, early childhood practitioners and researchers, administrators and policy makers at MOE. The present study has been first of its kind research carried out in any kindergarten school in Saudi Arabia. Therefore, majority of the recommendations and guidelines are essentially useful for the country and MOE. The study results have shown that both instructional programmes have been effective in enhancing the literacy skills of the participating kindergarten children however, the impact of educational games programme outnumbered the impact of TIP. We strongly recommend that caution must be practiced while considering the recommendations presented by the study, since the present study is based on a small sample size of 41 children. Furthermore, the generality of the study results to other regions and/or large Arabic speaking population can be questioned since the study results are based on the data collected from a single province in the Kingdom of Saudi Arabia.

1. At present, only few educational games programme and tutorial instructional programmes are available in Arabic that directly supports the development of literacy skills among kindergarten children. Therefore, applications developers should develop instructional programmes aimed at devices such as tablet computers namely iPad and Samsung Galaxy tab (both are currently very popular among young children in Gulf region but no statistical data is available), mobile devices and desktop computers aiming at Arabic speaking community. Additionally, software application developers should develop instructional programmes aimed at instructing basic concepts of science and mathematics for kindergarten children. However, this can be achieved only when the needs, expectations and requirements of kindergarten children, teachers and kindergarten schools are first understood from the potential instructional programmes.
2. Practitioners and researchers interesting in examining the role of newer interactive technologies such as iPads, surface-tables and instructional programmes should organize user studies so as to investigate the impact of these interactive technologies on the long term learning, academic performance and instruction at Kindergarten schools in Arabic speaking countries. This becomes essentially important since fewer studies exist on this underlying theme and almost all of them were aimed at kindergarten schools in western countries.

3. From cultural perspective, it has been seen that parents actively participate in the various educational activities of kindergarten children in Saudi Arabia. Therefore, we argue that necessary steps must be taken to ensure parents are equally involved in this inclusion process. Kindergarten school should organize training and awareness sessions concerning the importance of instructional programmes on enhancing the skills of their children. This will ensure that parents will equally participate in the promotion of instructional programmes and cooperate with educational researchers for the development of instructional programmes.
4. Based on the study results, we encourage public and private kindergarten schools to explore the use of different instructional programmes for enhancing emergent literacy skills among kindergarten children. The present study has shown that the instructional programmes are effective in enhancing literacy skills of children; therefore, it reveals positive impact on learning language. However, this also requires effort from Ministry of Education, as they should frame newer educational policies that encourage the use of instructional programmes at public and private kindergartens in Saudi Arabia.
5. The development of instructional programmes for Arabic speaking kindergarten children requires an integrated approach towards scientific theories and empirical studies examining impact of instructional programmes on early childhood learning and skill development. Furthermore, development of instructional programmes should emphasize the inculcating self-learning among young children.
6. Educational technology literature has shown that teachers have direct impact on the educational technology adoption in any educational context for-example classrooms. Therefore, drawing an inference from these scientific facts, we can also argue that attitude and perception of teacher towards instructional programmes have direct impact on the potential acceptance and adoption of instructional programmes in kindergarten schools. Due to this fact, we emphasize that teachers must be properly training so that they can independent use and perform troubleshooting if required, instructional programmes.
7. Kindergarten schools must provide necessary infrastructure so that every child can be instructed using instructional programmes within school building. This will ensure that all children get equally benefited from this new form of educational instruction.

LIMITATIONS OF THE STUDY

In this section, some of the main limitations of the present study are explained below:

1. The present study lacks qualitative component i.e., study participants and teachers were not interviewed in order to further understand and strengthen the claims made in the present study results. Therefore, in future work, we intend to collect more qualitative data from participants and teachers, so as to make present study results more meaningful
2. A longitudinal study with similar subjects and same research question is required, in order to examine the finding of the present study in light of scientific validity. Longitudinal study is a correlation study, which involves repeated observations with similar variables over a passage of time.
3. The present study consists of a small sample of participants from a single province of Saudi Arabia due to which, applicability of the study findings to the other regions within Saudi Arabia and other Arabic speaking countries is doubtful. Therefore, future work should include comparison of sample of data collected from different provinces within Saudi Arabia and other Arabic speaking countries. In this way, generality of the study findings can be examined and scientifically examined.

4. Presented study was not strictly controlled, so it is fairly possible that many un-controlled variables such as participant's prior knowledge about the taught concepts, differences in the teaching skills of the teachers, support received at home through parents and so on have impacting the study results. Therefore, in future work, we intend to perform an even better controlled study where more than two variables (i.e. TIP and educational game programme) will be controlled.

CONCLUSIONS AND FUTURE WORK

Previous research examining the impact of different instructional methodologies namely traditional classroom instruction versus computerized instructional programmes namely TIPS and educational game programme has been mostly organized in the developed world. However, the similar research in context to Arabic speaking kindergarten children has been little studied. Therefore, the present study has examined and investigated the effect of two different instructional programmes namely TIP and educational games programme (both developed in native Arabic) on the emergent literacy skills of kindergarten children. The study was organized with 41 participants age (5-6 years) in a kindergarten school located in City of Jeddah, Saudi Arabia and affiliated with MOE. Our study is first of its kind study that has examined the effectiveness of two different instructional programmes with Arabic kindergarten children. Interestingly, the study results have revealed that educational games programme was more effective compared to TIP, in improving the emergent literacy skills of the kindergarten children.

We compared the results of our study, with the previous studies examining similar research question but with population in developed world. It was found that our study results complement the findings of the previous studies for-example, (Campbell et. al., 2002; Wood and Bennett, 2006; Dochy et. al., 2006; Labbo et. al., 2000; Kirschner, 2002; Nikiforidou & Pange, 2010). This shows that our study is valid and it complies with the theoretical frameworks proposed by the researchers in other parts of the world.

In the future work, the author plans to evaluate the effectiveness of TIP and educational games programmes in enhancing the mathematics and science related skills of kindergarten children. This intended future work will be focussed at developing various theoretical models that will govern the integration of TIP and educational games programme as part of Kindergarten instruction. We assume that the construction of such theoretical framework will be of great value not only for the researchers in the field of educational technology but also for the kindergarten schools, children and their parents. These intended theoretical models might provide new insights on developing instructional programmes for kindergarten instruction that are focussed at enhancing the learning and related skills of the kindergarten children.

Other than this, author also aims to organize a similar study on a larger scale, which is longitudinal in nature. This intended study will aim at collecting larger samples from a combination of public and private schools not only from City of Jeddah, but also from other provinces within Saudi Arabia. Furthermore, we aim at repeating the study after every 6 months so as to compare the results obtained from the longitudinal methodology. This will also ensure that generality of the study results can be examined in the light of scientific validity.

ACKNOWLEDGEMENT

This work was funded by the Deanship of Scientific Research (DSR), King Abdulaziz University, Jeddah, under grant No. (419/253/1431). The authors, therefore, acknowledge with thanks DSR technical and financial support.

AUTHOR BIOGRAPHY

Dr. Nahla Gahwaji is the Vice Dean for Development, Associate Professor Childhood Studies Dept., at the Faculty of Home Economics, King Abdulaziz University, Saudi Arabia acquired PhD from University of Exeter in Early Childhood Education (ECE). She supervises master students and teaches courses primarily in Educational Leadership, Professional Development, and Quality Control Management for early years. She has various publications in the field of ECE and special research interest is ICT utilization in preschool education. She participates as a consultant to several bodies and participate several local and international conferences. Member of

the board of trustees of the Arab Council for Childhood and Development (ACCD) and other related organizations and societies local and international level. Email: ngahwaji@kau.edu.sa

REFERENCES

Aghlara, L. & Tamjid, N. (2011). The effect of digital games on Iranian children's vocabulary retention in foreign language acquisition, paper presented at the International Conference on Education and Educational Psychology (ICEEPSY 2011).

Amory, A, Naicker, K, Vincent J., Adams, C. (1999). The use of computer games as an educational tool: Identification of appropriate game types and elements. British Journal of Educational Technology. 30, 4, pp. 311-321

Astin, A. (1984) Student involvement: A developmental theory, College Student Personnel, 25, pp. 297-308.

Ayvac, H. & Deveciolu, Y. (2010). Computer-assisted instruction to teach concepts in pre-school education, Procedia Social and Behavioural Sciences 2, pp. 2083–2087.

BECTA (2001). Keyboard Skills in Schools (information sheet), www.becta.org.uk/technology/infosheets/index.html

Campbell, F., Ramey, C., Pungello, E., Sparling, J., & Miller-Johnson, S. (2002). Early childhood education: Young adult outcomes from the Abecedarian Project. Applied Developmental Science, 6, pp. 42-57.

Condie, R. Simpson, M. Payne, F. & Gray, D. (2002). Insights2, The Impact of ICT Initiatives in Scottish Schools, Scottish Executive, www.scotland.gov.uk/library5/education/ins2-00.asp

Clay, M. M. (1966). Emergent reading behavior. Unpublished doctoral dissertation, University of Auckland, New Zealand.

Evans, M. (2000). Home literacy activities and their influence on early literacy skills. Canadian Journal of Experimental Psychology, 54 (2), pp. 65–75.

Friedland, G., Hurst, W., & Knipping, L. (2007), Educational multimedia systems: the past, the present, and a glimpse into the future. In: Proceedings of the international Workshop on Educational Multimedia and Multimedia Education, pp. 1–4. ACM, New York

Fomichova, O. & Fomichov, V. (2000). Computers and the thought-producing self of the young child. The British Journal of Educational Technology, 31 (3) pp. 213–220.

Gahwaji, N. (2007). Learning through play for pre-school children at Jeddah - between support and opposition, Journal of Childhood Studies, Institute of Graduate Studies for Children, Cairo. 38 (11) pp. 61-83.

Gahwaji, N. (2011). The Effects of interactive teaching programs on preschool children's literacy skills: case study, the Journal of International Educational Research, 7, pp. 213-228.

Gibbons, J., Kincheloe, W., & Down, K. (1997) Tutored videotape instruction: a new use of electronics media in education, Science Magazine, pp. 1139- 1146. http://www.sciencemag.org/content/195/4283/1139.

Haugland, S. (1999). What role should technology plays in young children's learning? Young Children, 54 (6) pp. 26–31.

Haugland, S. (2000). Early Childhood Classrooms in the 21st Century: Using Computers to Maximize Learning. Young Children, 55 (1) pp. 12–18.

Kiili, K. 2005. Digital game-based learning: Towards an experimental gaming model. *The Internet and Higher Education* 8 (1): 13–24.

Kirriemur, J., & McFarlane, A. (2004). Literature review in games and learning. NESTA Future lab Series. Bristol: NESTA Future lab.

Kirschner, P. (2002). Cognitive load theory: implications of cognitive load theory on the design of learning, Learning and Instruction, (12), pp.1–10.

Johnson, D., Johnson, R., & Smith, K. (1998). Cooperative learning returns to college: What evidence is there that it works? Change, 30(4), 26--35.

Labbo, L., Sprague, L., Montero, M., & Font, G. (2000). Connecting a computer centre to themes, literature and kindergarteners' literacy needs. Reading Online, 4, 1. www.readingonline.org/electronic/labbo/.

Lankshear, C. & Knobel, M. (2003). New technologies in early childhood literacy research: a review of research, Journal of Early Childhood Literacy 3 (1), pp. 59-82.

Ministry of Education (2002). The Education Committee of Curriculum and Supervision (Ed.): Government Decree 407/A/26/09/02, Riyadh: MOE.

Montessori, M. (1912). The Montessori Method; Frederick Stokes Co, New York

Nechita, E. & Timofti, I. (2011). Increasing independence versus increasing collaboration with ICT Support. Procedia Social and Behavioural Sciences (29), pp. 1508–1517.

Nikiforidou, Z. & Pange, J. (2010). Shoes and Squares: A computer-based probabilistic game for preschoolers, Procedia Social and Behavioral Sciences (2), pp. 3150–3154.

Plowman, L. (1998). Reading multimedia texts. Language Matters, spring, pp. 19–22.

Plowman, L., Mateer, J. & Leakey, A. (2002). Connecting Schools, Libraries and Community Education Centres with ICT. Interchange research report for Scottish Executive Education Department.

Plowman, L. & Stephen, C. (2005). Children, play, and computers in pre-school education. British Journal of Educational Technology, 36 (2), pp. 145-157.

Prensky, M. (2001). Digital Game-Based Learning. New York: McGraw Hill.

Prensky, M. 2006. *Don't bother me Mom—I'm learning.* St. Paul, MN: Paragon House.
Rendon, L. (1994). Validating culturally diverse students: Toward a new model of learning and student development, Innovative higher education, 19 (1), pp. 33-51.
Rogoff, B., Ellis, S., & Gardner, W. (1984). Adjustment of adult–child instruction according to child's age and task. Developmental Psychology, (20), pp. 193-199.
Royle, K. 2008. Game-based learning: A different perspective. *Innovate* 4(4).
Segers, E. & Verhoeven, L. (2003). Effects of vocabulary training by computer in kindergarten. Journal of Computer Assisted Learning, (19), pp. 557-566.
Silvern, S. (1998). Educational implications of play with computers, in Fromberg, D. & Bergen, D. (eds), Play from Birth to Twelve and Beyond: Contexts, Perspectives, and Meaning, pp. 392–400, New York: Garland.
Singh, H. (2003). Building Effective Blended Learning Programs, Educational Technology, (43), pp. 51-54.
Sugar, W., Crawley, F. & Fine, B. (2004). Examining teachers' decisions to adopt new technology, Educational Technology and Society (7), pp. 201–213.
Teale, W. H., & Sulzby, E. (Eds.). (1986). Emergent literacy: Writing and reading. Norwood, NJ: Ablex.
Turbill, J. (2001). A researcher goes to school: Using technology in the Kindergarten literacy curriculum. Journal of Early Childhood Literacy, 1 (3). pp. 255–279.
Vygotsky, L. (1978). Internalization of Higher Cognitive Functions. Mind in Society: The Development of Higher Psychological Processes, Harvard University Press
Whitehurst, G. & Lonigan, C. (1998). Child development and emergent literacy. Child Development. (69), pp. 848-872.
Wood, E. & Bennett, N. (2006). Learning, pedagogy and curriculum in early childhood: sites for struggle, sites for progress. In L. Verschaffel, F. Dochy, M. Boekarts, & S. Vosniadou, (Eds.) Instructional Psychology: Past, present and future trends: Essays in Honor of Erik de Corte. European Association for Research in Learning and Instruction Advances in Learning and Instruction.

Table 1. Descriptive Statistics and T-Test Analysis

Instructional Programme	***n***	***M***	***SD***	**Calculated *t* value**	***df***	**Critical *t* value**	**Significance *A***
Tutorial instructional programme	21	11.619	3.154	0.073	39	2.45	0.943
Educational games	20	11.550	2.929				

Table 2. Descriptive Statistics of the Literacy Skill Assessment Test

Instructional Programme	***N***	***M***	***SD***
Tutorial instructional programme	21	24.95	2.25
Educational games	20	28.40	1.64

Table 3. The Results of the Analysis of Co-variance

Source of Variation	***Sum of squares***	***df***	***Average squares***	***calculated p value***	***Critical p value***	***significance***
Pre-test	56.677	1	56.677	22.653	5.42	0.000
Instructional programme	123.681	1	123.681	49.433	5.42	0.000
Error	95.075	38	2.502			
Total	273.512	40				