Virtual Learning: Examination of ICT as beneficial learning tool for children's social development

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Abstract

Nowadays, technology is advancing on daily basis and more resources are available for educational purposes. However, there are concerns regarding negative effects it can have on children's development. This research investigates the impact of technology, particularly computers on children's social behaviour. There is considerable amount of literature that focuses on children's computer use and its impact on children's health. Nevertheless, there is lack of research regarding the beneficial use of computers regarding children's social skills. This research examines whether computers can be used as a beneficial tool for children's education and social skills. The chosen methodology for this research includes systematic observation during usual teaching hours and intervention during the activity. The data gathered using these methods are analysed. The findings of this research suggest that computers can enhance children's social skills and improve communication among them if used in a beneficial way through the assistance of a facilitator. Information contained in this paper adds to contemporary research regarding computers in early years. Additionally, the findings aim to provide practitioners with basic suggestions on how to approach the ICT use in their lessons.

Keyword: ICT, social development, early years education, beneficial learning tool

1. Introduction

The use of Information and Communication Technology has been gradually increasing over the past years, especially ever since it became available to the general public. Children are exposed to various digital tools and media from their early childhood and ICT has become a major part of the educational curriculum. Since technology is implemented at schools and its use increases, it is necessary to evaluate its usefulness in the classrooms, especially in early year's settings and examine whether it hinders or enhances children's skills. The aim of this research was to assess the importance of ICT in early year's education and the impact it has on children's social interaction skills. The present study supports the claim that ICT is beneficial for children when the latter are assisted by a practitioner who acts as a facilitator. The idea of facilitation is based on the Zone of Proximal Development and Social Constructivism theory (Vygotsky cited in Berk, 2009), which focuses on what a student can do with the teacher's assistance and what he or she can do alone.

There are varying opinions on the use of ICT in children's lives and learning. There are beliefs of ICT being beneficial to children's development as well as concerns of it being harmful. The most controversial claim is the one expressed by Cordes and Miller (2000), who state that computers hasten the end of childhood. They argue that computers and technology in general impairs children's development, most notably pertaining to the social and emotional area. Malik et al. (2011) also warn that extreme computer use can cause children to be anti-social, especially

during online activities. Additionally according to Maynard (2010) computer use can harm children's language development. DATEC (2009) suggests that it is important for young children not to exceed the recommended time for computer use, which is twenty minutes.

In contrast, Plowman and Stephen (2003) claim that schools should prepare children for a place in technological world. According to Yelland (2002) and Lau (2000), computers were shown to have positive effect on children's learning. Plowman and Stephen (2003) oppose to Cordes' and Miller's (2000) claims and they disregard the necessity for extreme regulation of ICT as fears of new technology. Additionally, NAEYC (cited in Siraj-Blatchford and Whitebread, 2003) regards practitioner's judgement is vital in order to determine the appropriateness of technology inside classrooms.

The impact technology will have on children's learning depends on the practitioners (Lau et al., 2005). However, with a large variety at their disposal, practitioners may experience difficulties in choosing the appropriate programme (Willoughby et al., 2009). This is why it is necessary, alongside introducing technology into classrooms, to also provide help with the choice of developmentally appropriate software.

2. Research Plan

The present research involved seventeen children who attend an English Early-Year school in Athens, and it was confirmed by the head teacher that they had no learning disabilities. The classroom consisted of eight boys and nine girls whose age was five years old. The head of the school has provided his consent to conduct observations and data collection for this study and steps were taken in order to ensure the safety of the participants and the protection of their privacy. Children's names were not disclosed anywhere and are referred to by numbers in this study.

The participants for this study were selected by using Stratified Sampling technique, which combines random sampling and categorisation. The children were divided by gender into two categories – girls and boys. Afterwards they were randomly assigned into three groups. The groups consisted of equal number of boys and girls.

Based on a triangulation technique that combines quantitative and qualitative research methods (Bryman, 2008) a systematic observation was conducted during the first two weeks of the research. It took place in the classroom during a free-play activity on a computer, during which the children played different games installed there by the school. Each child of various groups was observed for ten minutes using the following table (Table 1). This table, based on Plowman's and Stephen's research (2005), was adjusted for the purpose of this research.

Sharing access and discussing turns among the children	Whether children themselves decide to line up or decide in what order to take turns, as well as making sure no child is left out
Discussion of the use of the computer application	Whether children suggest to each other various ways to use the application or give hints
Working in team during the digital activity	Whether they collaborate and discuss next move together, even if only one child is at the mouse and keyboard at the moment
Observing each other's play without communication	Whether children only watch their classmate's turn without engaging in any conversation
Excluding a child for various reasons from the digital activity	Whether a child is being excluded and pushed aside by his or her classmates
Requesting help from a competent person	Whether children ask a teacher for assistance on how to proceed in the application
Argument about the use of computer	Whether argument among children exists on how to take turns and who should be in charge

Table 1 - Categories

Afterwards a field experiment was carried out in the following week. Children were provided with an interactive game called "I Spy Fantasy". This game has been developed by Big Fish Games, Inc. (2011). While the initial purpose of this game was not to educate children, it was a belief that it can be used in an educational manner, as according to DATEC (2009) games that are in the classroom are not necessarily intended for educational purposes in order to be rendered beneficial. The game itself provides children with choices. Three main choices were available – the space, the deep of the sea and a castle. Each of these scenes had its own story. Additionally, it was fully voiced with rhymed presentation of the words, which allows for younger children who cannot read to participate in this game. This game was tested in a pilot test before the beginning of this research. Throughout the whole process, they were encouraged to participate in a discussion. The intervention was carried out on only one computer for a group of children. This choice is based on a research presented by Willoughby et al. (2009), who suggests that a single computer encourages more communication among children rather than one to one computer-child ratio.

During the fourth week children were encouraged to play this software game again alone, in order to assess whether they could use the software in suggested ways and whether their social interaction had improved. During this time another systematic observation was conducted as in the beginning.

3. Data Analysis

The SPSS Statistics 17.0 software was used for the data analysis. Chi-square test has shown that conditions were not satisfying for any of the seven categories and Fisher's Exact Test was used.

The first category 'sharing information' was analysed by using the aforementioned method. Data from pre-test and post-test were compared together. The comparison has shown that the two variables had no significant relationship (sig. 0,902) (Table 2)

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	13,458[a]	16	,639	,825		
Likelihood Ratio	14,878	16	,534	,902		
Fisher's Exact Test	13,560			,902		
Linear-by-Linear Association	,492[b]	1	,483	,520	,269	,040
N of Valid Cases	17					

a. 25 cells (100,0%) have expected count less than 5. The minimum expected count is ,12.
b. The standardized statistic is ,702.

Table 2 – Category "Sharing access among the children"

The second category data comparison 'discussion' pertaining to the period prior to intervention and after the intervention has also shown no significant relationship with each other (sig. 0,809) (Table 3).

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	11,657[a]	12	,474	,633		
Likelihood Ratio	9,713	12	,641	,751		
Fisher's Exact Test	11,456			,809		
Linear-by-Linear Association	2,416[b]	1	,120	,145	,080	,025
N of Valid Cases	17					

a. 20 cells (100,0%) have expected count less than 5. The minimum expected count is ,12.
b. The standardized statistic is 1,554.

Table 3 – Category "Discussion of the use of the computer application"

In the third category, again Fisher's Exact test illustrates that variables had no significant relationship between them (sig. 0,876) (Table 4).

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	2,574[a]	6	,860	,876		
Likelihood Ratio	3,412	6	,756	,876		
Fisher's Exact Test	5,683			,876		
Linear-by-Linear Association	,082[b]	1	,774	,868	,485	,124
N of Valid Cases	17					

a. 10 cells (83,3%) have expected count less than 5. The minimum expected count is ,06.
b. The standardized statistic is ,287.

Table 4 – Category "Working with a team"

The post and pre-test comparison of data of the fourth category of this study 'exclusion of a child' demonstrated that these variables also had no significant relationship between them (sig. 1,0) (Table 5).

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1,948[a]	4	,745	1,000		
Likelihood Ratio	2,200	4	,699	1,000		
Fisher's Exact Test	3,947			1,000		
Linear-by-Linear Association	1,234[b]	1	,267	,647	,353	,353
N of Valid Cases	17					

a. 9 cells (90,0%) have expected count less than 5. The minimum expected count is ,06.
b. The standardized statistic is 1,111.

Table 5 – Category "Exclusion of a child"

The category 'No communication' data had less of a difference post-test and pre-test but the two variables shown no significant relationship (sig. 0,575) (Table 6).

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	4,305[a]	4	,366	,431		
Likelihood Ratio	5,720	4	,221	,431		
Fisher's Exact Test	3,867			,575		
Linear-by-Linear Association	2,264[b]	1	,132	,155	,090	,048
N of Valid Cases	17					

a. 10 cells (100,0%) have expected count less than 5. The minimum expected count is ,41.
b. The standardized statistic is 1,505.

Table 6 – Category "No communication"

Sixth category of a 'child requesting help from a teacher' has shown that there is no relation between the variables and as such they have no significant relationship (sig. 0,709) (Table 7).

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	5,754[a]	8	,675	,709		
Likelihood Ratio	6,955	8	,542	,709		
Fisher's Exact Test	7,072			,709		
Linear-by-Linear Association	,519[b]	1	,471	,549	,263	,042
N of Valid Cases	17					

a. 15 cells (100,0%) have expected count less than 5. The minimum expected count is ,12.

b. The standardized statistic is ,721.

Table 7 – Category "Child requesting help"

The data of the last category concerning the 'argument about access to a computer' have shown no significant relationship (Table 8).

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	8,195[a]	6	,224	,426		
Likelihood Ratio	5,264	6	,510	,426		
Fisher's Exact Test	10,193			,426		
Linear-by-Linear Association	,073[b]	1	,787	,904	,283	,096
N of Valid Cases	17					

a. 11 cells (91,7%) have expected count less than 5. The minimum expected count is ,06.

b. The standardized statistic is ,270.

Table 8 – Category "Argument about access"

Summarising, the data so far have shown that children are positively influenced by facilitator's role in digital activities. Generally, the results have shown that exclusion can be reduced when assistance from teacher is available and communication increases when children are encouraged to participate in discussion.

4. Discussion and Conclusions

The purpose of this study was to find out whether facilitated digital activities are beneficial to children's social interaction. The literature investigated has shown disparity in opinions regarding the beneficial use of ICT, particularly computers. Cordes and Miller (2000) and Plowman and Stephen (2003) had significantly opposing beliefs concerning the benefits that the use of technology in early years settings. The findings of this research lean towards the benefits of digital activities, as the results have shown a significant difference between the non-assisted play and the play facilitated by a teacher, particularly in children's interaction. During the initial observation of non-coordinated play, the participants have shown minimal traces of communication amongst them. While there was still certain interaction, mostly to negotiate turn-taking, it did not evolve beyond that. Moreover, the findings have shown that there was a significantly higher rate of exclusion during non-assisted play, which is one of the main issues with ICT that the literature addresses (Malik et al., 2011 and Valentine et al., 2002). Children were reluctant to discuss the use of application and preferred to observe the activity during their peers' turns. It can be argued that they were enthralled while watching the game, enthusiastic and patient to wait for their turn instead of engaging in teamwork. Observation of such a game without actively participating in it leaves the children idle, which has negative effects on

children's social, emotional and language development (Cordes and Miller, 2000 and Maynard, 2010).

Furthermore, throughout the continuation of the research it has been shown that assistance and encouragement on the part of the practitioner have considerably increased the communication and sense of team work in the participants. This is in agreement with statements of Lau (2000) Plowman and Stephen (2003) and Yelland (2002). The participants of this study displayed improved social interaction after the facilitator's involvement, which reinforced their social skills. In addition, their communication developed to higher rates and exclusion was minimised. It can be argued that children could experience even further exclusion, had it not been for assistance and support. The participants followed their teacher's encouragement to discuss and seek assistance should they require it, which in turn had a positive impact on them. Overall, the results throughout the categories have shown improvement, which opposes to Cordes and Miller (2000) who claim that technology is mostly harmful to children. Discussion was commonplace during the intervention, and children often engaged in dialogue regarding the steps to be taken in order to proceed, choose a theme in the game as well as take turns. Furthermore, the facilitator's influence stayed with the children throughout the digital activities, leaving them with a strong sense of encouragement. A case could be made regarding the permanence of this facilitation, which raises the question of how consistent the teacher's assistance should be. There are few approaches for which evidence currently exists. Plowman and Stephen (2005) for instance highly suggest that digital activities should be approached in the same way as the rest of the activities done in the classroom through scaffolding. O'Hara (2008) highlights the potential of implementing technology into most aspects of learning and teachers should maintain interaction with children on a daily basis regarding ICT. Both the evidence and findings encourage practitioners to be consistently involved in children's computer play. Providing the participants with ideas of the programme use and proposing certain actions within the game fostered creativity and curiosity on the part of the children, who ultimately started suggesting possible actions to each other.

While this study has validated claims of benefits that technology can have on children's development and social skills which are in agreement with Lau (2000), Siraj-Blatchford (2003) and Yelland (2002), and illustrated possible solutions to the issues of social exclusion and anti-social behaviour ICT, presented by Lebens et al. (2009) and Valentine et al. (2002), can cause, it is necessary to also acknowledge that there are certain limitations to this study, which allow for further research, such as sample size or the use of only one specific software. It is essential to use different programmes in order to note possible dissimilarities and offer a wider variety to the participants.

This study has illustrated how a facilitator's approach during digital activities can enhance children's skills and promote social behaviour. While the dangers of exclusion and negative effect of ICT on children's social skills were lurking during the non-assisted play in this study, they were effectively removed through the teacher's encouragement, assistance and engagement. The fears of the negative impacts of technology are well placed by practitioners and researchers and they should definitely not be disregarded. However, rather than trying to avoid the use of technology in today's fast-paced world, it is essential to acknowledge the fact that it exists and seek positive solutions.

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