The Main Components of Creativity in Educational Game: A Case Study

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Abstract. Recently, due to the increase use of technology among children, fostering creativity in the virtual environment has become a challenge to investigate. Few studies have pointed out that young children can use an extensive area of technologies in order to elevate creativity and learning. The aim of the study is to identify pre-school children's usage of tablet apps and the response in terms of the impact on their learning, playing and creativity. In this study, researcher used a sample of apps that were preloaded onto one tablet. Participants were seven pre-school children (3–6 years old) in Foundation Stage 1 and 2 in a Montessori school. The video recording took place for ten days. The result from the study showed that apps can promote learning and creativity in a wide range of ways, subjected to the design of the apps and the child's individual preferences.

Keywords: Educational games · Game-based learning · Preschoolers
Case study · Creativity · Creative thinking

1 Introduction

Recently, the trend of using game based learning apps through touch screen devices among young children has been increasing. Most of preschoolers have access to devices, such as tablet and smartphone which has touch screen at home or school. These devices (tablet and smartphone) have become essential in daily routine of many young children [1]. According to the survey that was conducted to 1028 children around 3 to 5 years of age that was carried out by the National Literacy Trust demonstrated that more than 70% of the respondents have access to device such as tablet and smartphone (touch screen) either at home or school [2]. In addition to that, the number of games based learning apps in the market is also increasing. This also brings a rise in the attention of parents and teachers to this kind of educational games apps. Schuler (2012) reported that more than 80% of the top-selling apps in the Apple Apps Store are targeted to those in preschool and education purposes.

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So, in order to see how this app has been selected and used, research and analysis is needed [3, 4].

Apart from that, teachers and parents have raised their concerns to the researchers to investigate the effects of educational programs apps among young children. Due to the large number of these requests, a huge demand for study on the use of media and technology in preschool age were observed [4–6]. A wide range of prior studies on the use educational games for preschool, were largely focused on the training in the basic settings but not much were done on game analysis and creativity [7–9]. Also, due to the increasing use of technology among children, playing and fostering creativity in the virtual environment has become a challenge to be investigated [10–12]. Few studies have pointed out that young children can use an extensive area of technologies in order to elevate creativity [13]. However, further research on how to nurture the variety and creativity during games training is still needed [13, 14].

2 Literature Review

Creativity is a skill that can be used both in teaching and learning. Digital games are used as a means of teaching/learning that can improve student's learning motivation [15–17]. The games can also improve students' academic achievements [18], nurturing and enhancing thinking skills such as creativity, problem solving, collaboration, and critical thinking. According to the presence of elements in game such as; fantasy, curiosity and challenge, digital games will rise interest as well as motivate the children. The game-based learning have interacted with children, resulting in positive learning attitudes namely satisfaction in learning and motivation. These games can stimulate curiosity in children as well as. Other than that, they also encourage children to find new solution in problem solving for specifics circumstances.

3 Method

3.1 Interview Procedure

In this study, researchers used a sample of apps that were preloaded onto one tablet for eight children aged 3–5 years old in Foundation Stage 1 and 2 in a selected Montessori school. The apps used were the ones identified as the top six preschool children's apps commonly used by 3–5 year-olds based on research by Marsh et al. (2015–2016) in United Kingdom. In addition, six augmented reality apps were identified by the research team as suitable for this age group. All children in Foundation Stage classes 1 and 2 were invited to participate in the research. The children's age are outlined in Table 1. Prior to the video recording session, all the children had experience using tablets, although not all of the children have access of tablets at their homes.

Table 1. Demographic profiles of the case study children

Children No.	Name (pseudonym)	Gender	Age at start of study	Class
1	Olivia	Female	6 years	Key stage 1
2	Yu Xin	Male	5 years 8 months	Key stage 1
3	Mani	Male	5 years	Foundation stage 3 (Reception)
4	Michael	Male	4 years 3 months	Foundation stage 3 (Reception)
5	Max	Male	4 years 6 months	Foundation stage 2 (Reception)
6	Ian	Female	3 years 8 months	Foundation stage 2 (Reception)
7	Lela	Female	3 years 2 months	Foundation stage 1 (Nursery)

3.2 Observation of Type of Creative Thinking and Apps Children Use

The video recording took place on two phases of ten separate days over a period of 3 months. The children were recorded using apps sometimes chosen by them but at certain times, they were directed to specific apps by the researcher and teachers. The camera focused on the child's interaction with the screen. Researcher recorded the video in total of 21 h per phase as illustrated in Fig. 1.

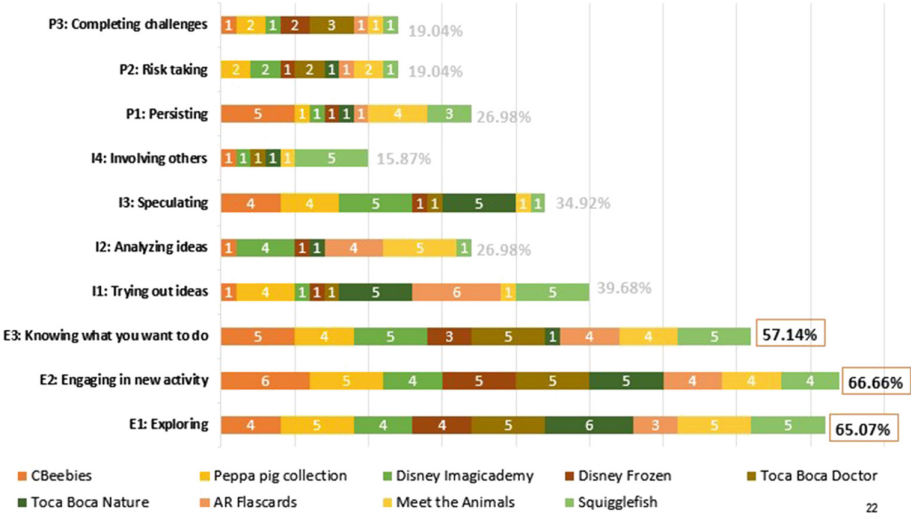

Fig. 1. Observation of the type of creative thinking and apps children use

4 Conclusion

One of the latest trends in mobile phones is the wave of smart phone apps, which includes game-based learning and creativity apps. As at current, research in this area is actively conducted, although its shape and lines are not yet clear. It also needs more insight and knowledge about what is happening in this emerging line at the current stage. This paper aims to divide the research into four categories: reviews and surveys, research studies on apps, developmental efforts and framework suggestions through the review and categorization of explanations. Thus, combining both the components of creativity and learning within a single model or framework could provide better performance for preschooler's level.

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