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Study and Development of Early Childhood Educational Learning using Interactive Strategy based on 2D-Animation

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Abstract

The aim of the project reflects on the usage of interactive techniques based on 2D-animation. Early childhood learning ages are of 0 to 8 but this project its primarily focused on the educational aspect for the ages of 4 to 5. The analysis is to prove that early introduction of technology can result in positive aspects of learning and growth factors. It is also to instigate that the use of animation in learning can mold a tender aged growing mind in ways that eludes the tedious and traditional methods of grasping knowledge. In addition, it is to prove that this interactive study can also make the user not know whether they are learning but will cause them to indirectly master skills that will have auspicious results in the long run. The animated learning consists of basic preschool knowledge but manipulated to be interactive to keep the user engaged. Changing the education system by reducing paper-based methods with technology will have the mind stretched positively and in ways that will cause it to redefine its original dimensions which will thoroughly be tested through simplified testing methods.

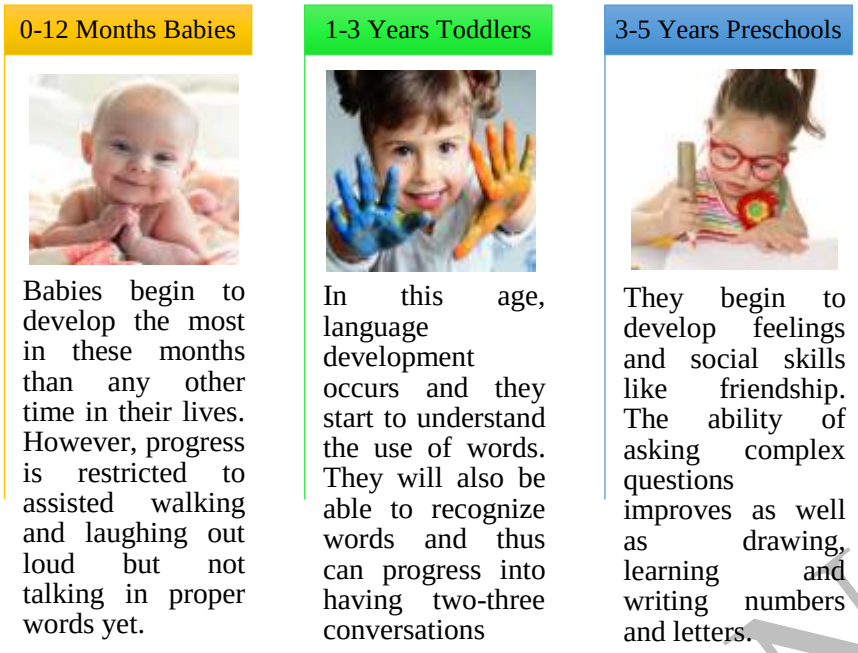
Keywords

2D-Animation, Education, Engagement, Growing, Interactivity

Introduction

Early childhood is known to be the age of rapid progress of the human life-span. It is identified as the period starting from birth till the age of eight years and are critical in aspects of healthy growth which includes their physical, emotional and cognitive development (Walter & Wrester, 2009). It is the age where children find anything and everything around them absolutely fascinating. They awe at whatever moves and whatever is still. In their mind, they are constantly thriving to inspect and search for more and the why. Early childhood learning serves as education for children before they reach the age to go to elementary school. Preschools are designed to teach children who are three to five. ("What is Early Childhood Education | What is a Preschool Teacher," 2017). The figure below explains the cognitive skills of the child development ages from 0 to 5.

Figure 1 *Cognitive Skill Development of Children*



(Bertsche, 2015) (Ryan, 2017) ("Great Beginnings Preschool and Childcare – Testimonials," 2017)

Preschoolers are known to be more of the explorers than the clumsy toddlers they once were. It is specifically the transitioning age from four to five that they learn letters, counting and colours rapidly and are able to carry out more conversations along with being able to tell stories. They can grasp thousands of words and have a rapid development in skills such as cognitive, physical, emotional, sensory and language ("Growth and Development, Ages 2 to 5 Years-Topic Overview," 2017).

Technology growth has been that of a magic bean; sprouting ever-greenly and replacing manual concepts with automation along with the visual simulations which enhances its wonder and captures the user's attention within seconds. Animation is a budding constituent of this innovation which has displayed itself in forms of interactivity and visual simulation exemplified with its simplicity and rich colours that can ignite a comprehensive understanding in many regardless of the age, gender or race.

According to Soffar (2016), in learning, animation was said to connect the pupils with the content that they are studying by having a deeper interaction with it in a colourful environment that is created visually. They are likely to conform the knowledge presented to them and thus igniting the need to grasp information through motivation. Hence, amplifying the experience and reducing learner's time.

While adults have discovered and enhanced their understanding, simultaneously honing their skills from animated learning, some preschools don't fall behind. In fact, most of them have introduced animation in learning and this has impacted in developing cognitive and motor skills

for preschoolers effectively. Although, it is the technology used to demonstrate animation that has developed the motor skills. The development of motor and collaborative skill was pointed out by Plowman and Stephen (2007) where it was discussed that such skills can be sharpened by introducing technology in preschool settings and can be integrated into play time sporting fun and expanding the range of activities to do.

Introduction of tablets to preschools have been a fascinating wonder of upping the game of education system among parents and preschools in many countries. In a literature review conducted in the UK, 2014, it stated that the reason why most educational institutes have adopted the use of tablets is because the PCs installed would often have long boot-up times during which the students would lose focus as well as frequent software problems would be the main cause of unsatisfactory experience (Clarke & Svanaes, 2014).

There is capacity on the Internet for learning and self-improving like for children who have problem learning. Reading difficulty is one the finest examples commonly seen in children as some of them simply dislike this task and are not in any way inspired to read when they have been assigned to do so and usually associate it with unpleasant experience thus increasing the loath towards the activity. But by using the right technology with effective instructional methods, academic gains can be made even by proficient readers (Morgan, 2013).

This is where the concept of technology gives birth to one of its many successors i.e. learning which brings forth light to one of its many sub-categories called Animation or Interactive Learning. Animation is ubiquitous in the sense that in our everyday lives we are experiencing it through education, advertising and marketing etcetera. In a research report on Computer Technology, it was stated that, students recollect only "20% of what they see, 30% of what they hear, 50% of what they see and hear and as much as 80% of what they see, hear and do" (Hofstetter, 1995).

Interactive Learning is said to be a popular learning trend which educational institutions are starting to adapt. They are said to benefit both the students and educators by creating an atmosphere of interactivity which brings about sparks of interest and enriches passive learning. When spoken about passive learning, schools still incorporate it through memorization, equations or figures but combining interactive learning helps in polishing cognitive skills like critical thinking, analytic reasoning and open-ended questions loaded with concepts of logic and coated with imagination by inviting the use of technology thus creating a technology-rich environment which would feel homely to children born into it ("Understanding Interactive Learning | Scholastic.com," 2017)

Moreover, the added strengths of interactive learning causes the development of social capabilities in the young minds especially in terms of collaborative and organized communication. This can arise from following rules of the system which can be taught step by step by the system or by the educator. Following the rules can bring about an addition of trust as well. This can encourage them to work together and achieve goals within a safe environment full of opportunities of learning in an interactive method. When it comes to interactive learning often many associate it with words like fun and enjoyment but it is in fact a bonus aspect of the pedagogy techniques that are already implemented.

Although, Ni and Yu (2015) added upon the discussion on educational games that the parents and educators worry when it comes to interactive learning in school settings mainly because they fear that it is playing rather than learning as they have no way of tracking such an activity. In addition, other issue is about how a youth of such an age could be able to comprehend applications or systems. Coupled with those matters, tablets are of preferable choice in terms of portability or even weight but financially speaking it could be a burden for the educational institute to provide their students with that or for the parents to purchase such expensive gadgets other than school gear.

Correspondingly, systems or apps would often have ads pop up which could be a serious problem in case of children clicking them and going to inappropriate sites or places. It is nevertheless a dangerous issue that many don't take it seriously and can go unnoticed by business pupils but not by the concerning parents of the child.

The study was carried out to deeply investigate the concerning matters as stated above and finding a form of rectification where both parties i.e. preschool children are learning the basics of preschool with induced entertainment and parents/guardians are able to track their child's progress and have the comfort of safety and security from the app features. In turn, proving that technology use under preschool settings can be made acceptable if done right. The objectives of this project were mainly as follows:

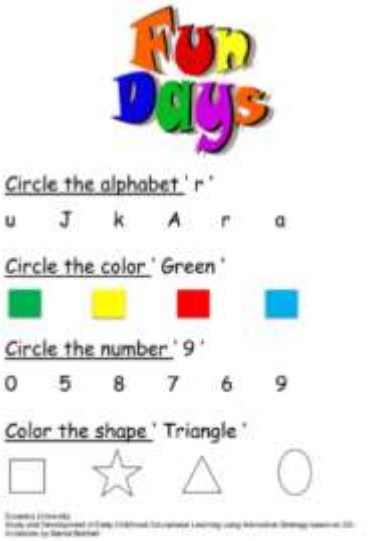
1. Study and analyze the strength and weakness of introducing interactive and/or animation to early childhood learning.
2. Design and develop an animated system which uses interactive learning.
3. Conduct pre-testing and post-testing of the investigation prior and after the system usage.

Methodology

Prior to the system development, information regarding the current status and knowledge on the subject was needed to be investigated. This resulted into carrying out primarily two fact-finding techniques; Interview and Online-based Questionnaires i.e. Google Forms. This rich data collection was then analyzed and materials that seemed relevant and useful were then used in the development process.

In addition, there was a pre-testing conducted. However, before carrying out the test, investigation on the basic understanding of preschool education was made. Through research, it was concluded that knowledge of knowing the alphabets, shapes, colours and counting from 1 to 10 and 10 to 20 is of importance (Krissy of B-Inspired Mama, 2018). With reference to the acquired understanding, four questions based on each category were created. The evaluation i.e. pre-test and post-test for the application called "Fun Days" is as shown:

Figure 2 *Pretest and Post-test for end-users*



Three questions asked the respondents to circle the correct answer and the last one consisted of colouring in the right one. This was done to see whether children recognize the idea of being told to circle and colour as different methods of answering.

The test was carried out in two methods. One set of tests was conducted with **11(ELEVEN)** overseas individuals. The parents or guardians of such children were contacted and were asked the permission to conduct the test. They were advised to use methods like using drawing tools on the tablets to edit in the answer or print and use stationary to answer. The other set of tests were carried out by the author attending a preschool called "Genius Aulad" with an appointment set with **7(SEVEN)** children between the tender ages of 4 and 5. They were given coloured printed copies and were asked to fill in with stationary provided.

Table 1 *PRETESTING RESULTS*

Category:	**Correct**	**Incorrect**
Overseas	2(TWO)	9(NINE)
Local	2(TWO)	5(FIVE)

The set with the overseas respondents was analysed and it was seen that **9(NINE)** pre-schoolers had incorrect answering while **2(TWO)** were correct. The set with the face to face results had **5(FIVE)** incorrect answering and **2(TWO)** were correct. This brought about to total incorrect being **14(FOURTEEN)** and correct being **4(FOUR)**.

After the system was fully functional and tested out in aspects of technicality, one of the tests it had to go through was Beta Testing. This meant that the respondent's involvement was necessary thus the author went to the preschool called "Genius Aulad" and had a one-on-one with a sample of **18(EIGHTEEN)** children to use the system and do the post-test similar to pre-test evaluation form. The post-test results were analyzed and observation of the respondents to the system was included as part of analysis techniques.

Results and Discussion

The online questionnaires and interviews that were conducted prior to the system development resulted into a rich media of a possible foreseen system. The outcome of the questionnaire was a summary of information which consisted of parents or teacher's statistical data in terms of demographic profile which yielded 57.7% Females and 42.3% Males. It was noted that 42.3% were supporters, 9.6% as opponents and 48.1% were neutral about the integration of technology with kids schooling. Other profiles included information about whether they had experience of having or teaching a preschooler along with asking about their input on the 'right' system features.

It was seen that the respondents were actively in support of the integration of technology with preschoolers and that they wanted to see features which could serve useful in terms of heightening their preschool knowledge consumption.

The interviews were conducted on a handful of people who were experienced i.e. either had a preschool child or taught at a preschool. Out of the four-people interviewed, 50% of them were supporters while the other 50% were against technology integration.

The system was developed with having key features like secure access for parents to view child's progress, privacy policy, ratings and guide of how to use the app. The main feature was that there was a division of "Let's Learn" and "Let's Play" as separate sections which acted as correlating categories. The child would be able to learn the basics and test out in the gaming section which would keep track of their progress. This also enabled parents who can't afford to send their children to preschool to help their child learn the basics. In addition, it gives freedom to preschools/daycares to use this app as an added activity.

It was observed that during pre-testing, the children at the preschool had issues about marking the right answer and were told to make circle or colour in the answers. And after using the system and attempting the post-testing, they didn't need much direction as to how to answers. To be specific, **11(ELEVEN)** were of correct answering and **7(SEVEN)** were wrong. They seemed joyous upon getting the answers done correctly or had expressions of happiness while playing the games.

However, this app was solely targeted for preschool children who didn't have special needs. There is a vast possibility of incorporating that aspect to the application. This way, no child would be left behind when it comes to receiving education with entertainment. Other improvements like having multiple language can encourage a wider audience to use. In addition, the automated voice used for pronunciation or compliments can be switched to a more human voice to have the missing element of warmth to be filled. Lastly, parents could be given a wider range of features other than monitoring the child's progress i.e. adding a feature where the difficulty or study of course is based on the child's age.

Conclusions

This project was about chasing after reasoning and increasing awareness about how important it is to tap into children's education and inducing a stream of technology which can be made safe

and secure while helping the parents/guardian to monitor the learning activity. With such an input, it provides comfort to the parents or teachers and helps them comprehend that the app is benefiting their child.

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