

## What element that influence preschool and elementary school children to enjoy playing education games?

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**Abstract:** Digital games are popular with many people and all ages, and various types of games and game genres have been published in the world market, one of the genres is educational games. However, it was found that the educational game genre was less attractive for students than entertainment games. The problem is how to increase attracting students attention to educational games, so the student more prefer playing educational games because besides being fun, educational games also have useful values for them. In this study, will do comparison attractiveness of educational games for preschool and elementary school children with entertainment games and the reason why entertainment games is more desirable by students than educational games, by installing several educational games on the respondent's device and then conducting observations and interviews to the parents or guardians of students to find out the level of children's interest in these educational games and the reasons for their interest or disinterest in educational games. The results that we got were that most children were only interested in playing educational games at first, but after a while, the children would return to playing their favorite entertainment games. There are some elements that are often not used in educational games but always use in entertainment games student's favorite, such as story elements, challenges, rewards, character and color, and it is estimated that if educational games adding these elements, it can be predicted that will increase the attractiveness of the education games.

**Keywords** – Game Element, Education Games, Entertainment Games, Preschool, Elementary School

### I. INTRODUCTION

Learning using game models in the form of mobile games, desktop games or using web games has proven that can increase student motivation in learning [1, 2]. In addition, education in the form of games can improve linguistic and mathematical logic for the users [3, 4]. Favorite genres in games based on age levels are very different. For high school and junior high school student, they prefer games with more challenging genres with high game complexity, such as war games, horror or strategy games. [5-7]. Whereas at the elementary or preschool level, the students prefer casual, adventure and games with simple themes and gameplay [8, 9].

Based on research study by Ritterfeld Ute, in his research that the educational games are less attractive to students than entertainment games [10, 11]. This study aims to obtain a comprehensive picture, reasons and comparisons of children's favourite in playing entertainment games compared to educational games, as well as to find out whether it is true or not that game entertainment is more desirable by preschool and elementary school children compared to education games. And also to find out how to attract students' attention to play more educational games than entertainment games by improving the elements of educational games [12-13]. Besides that, this study also aims to obtain information about the type or genre of entertainment games favoured by preschoolers and elementary school children [14], so when building an educational game targeting primary and preschool age, can be made educational games that resemble the entertainment game genre favored by children by adding elements used in the entertainment game, So it is hoped that with this method, educational games that will be made can more attract children's attention and also can adding knowledge to the student as user.

### II. RESEARCH METHOD

Digital educational games are games that are created by a game developer that aim to provide an educational experience or learning experience for its users [15], It can also be said that educational games are a way of providing knowledge and learning for users with a pleasant experience [13, 14]. Digital entertainment games are digital games that are made with the aim of entertaining and providing a diverse experience for its users, entertainment games sometimes include learning content, but the focus of game entertainment is the enjoyment of playing digital games. [10, 15-16].

This research focused on "what a child wants or desired when playing the educational games". So that educational games that are made by developer games can also be interesting like entertainment games [20], with the aim when a child plays the educational games with entertainment elements games, they will enjoy the game and also get knowledge that will be useful for their future.

In this study, interviews were conducted with parents or guardians who have preschool and elementary

school children with a range of aged five to eight years old, which was conducted online by asking questions related to the games their children often play, with a total of 53 respondents. The respondents come from various places in the Tangerang area, Indonesia. Besides that, observations, questions and answers were also carried out to several respondents from preschool and elementary school children, by doing installation modern educational games according to our selected suggestions or from parents suggestion to devices that children usually use to play digital games,

After a few days of installation and giving children the time to play educational digital games for a few days, an observation will be continue to "whether the child is still playing the educational game or not" and after that, will be ask the questions to parents or guardians and also to the children himself, is the children enjoy to playing educational games and is the children still often playing that educational games.

### III. RESULT AND DISCUSSION

The following are some questions from interviews that have been conducted with parents or guardians of preschool or primary school children. Initial question is, "does your child like to play digital games? (Q1) If the respondent's answer is "no", then the interview will be ended, but if the respondent's answer is "yes", then it will be asked the next question, the next question is "has your child ever played digital educational games? (Q2)", if the respondent's answer is "yes", then the next question will be asked, "how often do your children play these educational games? (Q3)", and then proceed to the question "Does your child still play these educational games until now? (Q4)", if the answer to the previous question is "yes", then it will be asked again, "What is the title of the educational game played by your child? (Q5)". However, if the respondent states that their child does not continue playing educational games anymore, then they will be asked, "What is the reason for your child not continuing to play education anymore? (Q6)". If the respondent states that they have never played educational games, they will be asked, "What entertainment game titles do your children usually play? (Q7)". In addition to the questions above, respondents who have children who enjoy playing digital games will also be asked, "What game platform does your child use to play digital games? (Q8)". At this question, we were given a choices, such as mobile platforms, personal computers, gaming gadgets such as Nintendo 3DS, PlayStation Portable and others or console platforms such as PS4, Nintendo Switch and others. And then the last question will be asked, "How long does it take for your child to play games in one day? (Q9)" to find out the level of daily activity of children in playing digital games. And in Fig 1 shows the flow of the interview questions to the parents or guardians of the students.

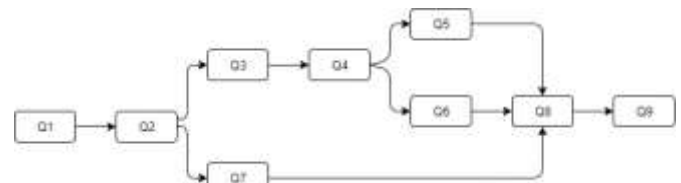


Fig. 1 Question Interview flow

To find out the responses of the preschool and elementary school children players, we also conduct observations and ask the questions to preschool and elementary school children, after they installing an educational games and after asking the children to play the education games for a few days. After that, we ask the question to the parent or guardian of the child and after that we also directly ask the question to the child, the question is, "Did the child play the suggested educational game?" All parents or guardians of the child answered that the child initially enjoy playing the educational game for a period of time, but then the child returned to playing his favorite entertainment game. And after that we also asked the child, "Why don't you play this game (while showing the educational game that has been installed before), do you not like the game?", and here are some answers from children who had tried the educational game. "The games is not exciting", "boring", "don't want to", "it's hard to play the game", "I just want to play princess games (one of the game titles or the child's favorite type of entertainment game)".

Based on the results of interviews and studies that we have conducted, it was found that only about 4% of preschool and primary school children do not play digital games, while the rest all preschool and primary school children play digital games, which is 96%. Then for children who had tried playing the educational type, there were 88% and those who had never tried playing digital games with educational themes were only 12%, but the percentage of routine or frequent playing digital educational games was very small, which was only 4%. And almost no child is still playing these educational digital games frequently or routinely until now, which is 2%, and not all parents of these children know for sure why their child has stopped playing or no longer plays educational games, which is 92%, but the children prefer playing entertainment games, because most children answered the educational games is "boring", "not fun" or "hard to play". And for educational games titles that are quite popular among respondents are the Baby bus educational game by 16%, the Educa Game Studio game by 12%, and other educational games by 73%. The next question for children who play digital games is about entertainment game titles that are often played by children, most parents of children say that game is "Mobile Legends" is favoured by children by 31%, and "Roblox" games favoured by children is 27%, and 18%, for "Minecraft games" as favoured games by children, the rest of the entertainment games favoured by children is "PUBG", "Truck Simulator", "Wormzone" and others entertainment games, which get vote 24% from the children.

The devices used by preschool and elementary school children to play games were mobile devices by 82%, then who used console games were 6%, and who used portable gadget game devices were 2%, and 10% of students used personal computers or a laptop for playing games. Then for the time of playing for children in one day, 67% of respondents answered two to three hours a day their child playing games, while 24% of respondents answered about one to two hours a day, while only 4% of those who played less than an hour a day, and for respondents who answered over three hours a day there is as much as 6%. The results of the presentation of questions from the questions asked to parent respondents can be seen in Table I.

TABLE I. TABLE QUESTION AND ANSWER RESULT

Q	Answer			
	Yes	No		
Q1	51 (96%)	2 (4%)		
Q2	45 (88%)	6 (12%)		
Q3	Often	No Often		
	2 (4%)	49 (96%)		
Q4	Yes	No		
	1 (2%)	50 (98%)		
Q5	Baby Bus	Educa Games	Other	
	8 (16%)	6 (12%)	37 (73%)	
Q6	Don't Know	Other Reason		
	47 (92%)	4 (8%)		
Q7	Mobile Legend	Roblox	Minecraft	Other
	16 (31%)	14 (27%)	9 (18%)	12 (24%)
Q8	Smartphone	Console	Game Gadget	PC
	42 (82%)	3 (6%)	1 (2%)	5 (10%)
Q9	Less Than 1 Hours/day	1-2 Hours/day	2-3 Hours/day	More than 3 Hours/day
	2 (4%)	12 (24%)	34 (67%)	3 (6%)

From the results of interviews and observations and comparisons of educational games that played by children with favoured entertainment games by preschool and elementary school children, here are the elements that are considered to making educational games for kids. These elements are still rarely used in an educational game, but always used in entertainment games that are favoured by these children. The elements are the existence of a main character which is the main key that can attract children's attention, the characters favoured by pre-schoolers are funny, cute and cheerful [21], Other Elements is colour, because preschool and elementary school children really like games that look brightful and colourful [22]. Challenges in entertainment games also play an important role in the passion of players in playing games [23], In entertainment games, the difficulty level often increases corresponding increasing levels or according to the length of the gameplay, this is one element that is rarely found in educational games. Rewards elements in an entertainment game also really make children happy, the reward is not just giving a stars when completing the game, but can also open levels or can be in

the form of special items that can be used to upgrade an object, for example on a character or avatar [24]. The last element that is usually not present in an educational game is the story of a game, in entertainment games there is a story at the beginning, middle or ending of the game, but this element is rarely found in educational games [25].

## CONCLUSIONS

The conclusion of this study, preschool and elementary school student are still less interested to playing educational games and children feel bored quickly when playing educational games compared to entertainment games, in general the reason obtained from child and parent respondents is because educational games tend to be boring, not interesting and less challenging. After making observations and comparisons between educational games and entertainment games favored by children, it is found that several elements of game entertainment are not available or are not used in most educational games, such as story, challenge, reward, character and color elements. The absence of these elements in educational games is considered to be the cause of the reduced attractiveness of educational games by pre-schoolers and elementary school children.

## FUTERE WORK

In the next stage, an educational game application will be built with the addition of elements needed to attract children's attention, such as character elements, colors on the menu and gameplay as well as rewards and praise in the form of sound and text.

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