Research article

Teachers' and Parents' Viewpoints of Game-Based Learning: An Exploratory Study

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Abstract.
During the recent global pandemic, children's screen time has been raised due to learning at home programs. Unexpectedly, teachers and parents have been forced to adapt to digital learning technology for children's education. This study aimed to explore the anxiety and dilemmas faced by teachers and parents in using game-based digital learning. The researcher argues that their role as educators and facilitators in digital learning and playing activity is critical. It is essential to understand how they view, deal with, and experience game-based learning before developing an educational game. A gap was found in the existing studies about teachers' and parents' perspectives of game-based learning. Two questionnaires were developed separately for teachers and parents of primary school children in East Java, Indonesia. The results provided information about the teachers' and parents' concerns about digital learning, including their frustrations and motivations.

Keywords: game design, game-based learning, educational game, digital learning, human-centered design

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1. INTRODUCTION

Playing games is supposed to be a fun activity with clear goals and rewards, relying on communication between the player and their character, the player and the content, and even players with one another [1]. Integrating pedagogical settings into playful gaming activity is known as huge potential in the learning experience. Despite the enormous previous studies and projects about enhancing the learning process with games, the need to enlarge the studies into a wider area is still quite interesting. Therefore, designing playful educational games for children is not an easy project. In game-based learning, the children or students are the end-user, while their parents and teacher have a pivotal role in deciding the content and context. Parents have the responsibility in children's daily life, while teachers have the most in-depth understanding of their classroom, students, and learning environment. Teachers are often confronted with educational technology and interactive games that are rigid constructs with no space

for adaptation. It causes a lack of ownership and comfort with new technologies and media, such as immersive learning games [2], [3].

On the other hand, in research about digital game-based learning, the likely negative perceptions of parents are often enlisted as a barrier toward the adoption of games in classroom settings [4]. Teachers, students, and policymakers appear to be influenced by what parents think about games in the classroom. In many cases, the initial ideas and conception process is carried out exclusively by the research team when designing new technologies with users [1].

Generally speaking, teachers and parents agree that games can increase children's interest in learning. However, teachers often feel uncertain about using games in the classroom because they believe games are too complicated and addictive (Alter, 2017; Kardaras, 2017; Strohman & Westendorf, 2015). The previous studies about what teachers and parents think about game-based learning still require improvement. Significantly, the year 2020 remarked the new learning system worldwide with study from home program, a sudden event that changed the whole Education to digital learning. Following that global outbreak, the teacher's and parent's perspectives toward game-based learning are changing. It is important to study these new parental and educational beliefs about games. Regarding the transition into a normal education in 2021, we argue that digital learning, like game-based learning, will continue to grow.

This study aims to explore teacher's and parent's viewpoints toward game-based learning to support the problem statement in the ongoing game design research. Developing a solid problem statement in the exploratory phase of research is crucial. We will adopt the Human-Centered Design (HCD) methodology in our study so that we began the investigation by building a deep empathy with teachers and parents. In this paper, we present a mixed-method methodology with two questionnaires to collect demographic data and personal experience in game-based learning from primary school teachers and parents.

METHODS

1.1. Design

This study applied Human-Centered Design (HCD) methodology to begin the research by building a deep empathy with teachers and parents. This paper employed a mixed-method methodology with two questionnaires for primary school teachers and parents and online group discussions to get feedback and evaluation from game experts. In the next step, we integrated quantitative data by analyzing responses from the Google

Form and analyzing the online group discussion from the Telegram group. The main objective of our research is to determine the parent's and teacher's perspectives about game-based learning. Figure ?? provides the overview of the methods we started from the literature review to achieve the problem statement.

1.2. Data Collections

Since we were primarily interested in teacher and parent perceptions in game-based learning, we conducted survey questionnaires and online group discussions. The teacher questionnaire consisted of twenty questions divided into four phases: demographic information, teaching experience, digital tools ability, and gamification experience. Meanwhile, the parent questionnaire entailed twenty-five questions divided into three sections: demographic data, children's screen-time, and digital tool ability, and parental relationship.

1.3. Data Analysis

We analyze and organize the responses from the Google Form with the spreadsheet that is automatically created from this software. For the multiple-choice questions, we evaluated the empirical data from the diagram's result. Otherwise, manual coding was employed to categorize the answers from the open questions.

2. FINDING AND DISCUSSION

2.1. Parent's and Teacher's Demographic

From public and private schools, we published two questionnaires for parents and primary school teachers in East Java, Indonesia. In total, we received 35 responses from teachers and 42 responses from parents. About 77,1% of teachers' respondents (27 people) are women since the number of Indonesian primary school female teachers is two-thirds higher than that of male teachers [5]. Half of the teachers are in their 30's and a quarter of them are in their 40's, which mostly have Bachelor's degrees in Education. About 70% of teachers have more than ten years of teaching experience, which is ideal for understanding traditional and digital education systems. Table 1 shows the teacher's demographic information.

On the other hand, about 86% of parents (36 people) are female or mothers, which explains why most respondents are homemakers. All of them are above 30 years old, mainly in their 30's (30 people). About half of the parents (21 people) have a Bachelor's degree. Ten people finished their Education until high school, seven have Master's degrees, and four people only finished primary school and middle school. We argued that it is crucial to understand who lives with the children since sometimes their nanny or grandparent controls the children's screen time.

2.2. The result from the parent questionnaire

For the children's daily screen time, 15 parents answered that they allowed their children to use the gadget for 1-2 hours per day, another 15 parents permitted their children to have screen time for 2-4 hours, and seven parents answer tolerated their kids to have 4-6 hours of screen time. According to the mentioned data, 74% of parents responded that the screen-time is including the study at-home session. In comparison, 26% who answer that it does not include the study time at home give their children 1-2 hours (8 parents) and 2-4 hours (3 parents) of screen time. So that, it will be possible that these parents allow more screen time. About 62% of parents (26 people) bought their children a gadget (mostly a smartphone) with some reasons: to facilitate their children learning process (42%); to teach children about technology (38%); and to ease the communication with children (16%). Meanwhile, 38% of parents (16 people) who did not allow their children to have their own gadget mentioned their worries that their children might access inappropriate content. It is too early for their age and the possibility of gadget addiction.

For interaction experience, 29 parents (70%) argued that touch-screen gadgets are the best for learning. According to 25 parents (60%), balancing digital media with books is best for their children. From the types of digital learning for the children that we offered, 52% of parents (22 people) chose online learning with a teacher, 31% of parents (13 people) decided to learn through games and animation, and 17% of parents (6 people) chose to learn through animation. When we gave the open question about "what are your concerns as a parent with digital learning at school?", 37% of parents (16 people) were worried about their children's lack of social interaction. It is quite interesting, and we might need to explore this answer more because the parents answered this question during the pandemic, in which all the children should stay at home for an extended period.

Further research could be conducted to understand if the answer is based on the pandemic situation or the parent also worried about their children's social life before the confinement. Moreover, 21% of parents (8 people) were concerned about health issues, 18% of parents worried about digital addiction. At the same time, the rest argued that digital learning could lead to access to unnecessary content and the difficulty of understanding the context.

Furthermore, in the five-Likert scale question, we found an issue regarding cultural behavior. It seems that Indonesian people prefer to give neutral answers or agree and disagree. The question is "give your opinion on the positive effect of playing the game" with six statements : (1) add virtual friends; (2) improve children's creative thinking; (3) children's teamwork training; (4) boredom-busting; (5) improve children's vocabulary; (6) improve children's learning interest; respectively. We got more neutral answers than agree and disagree responses in "children's teamwork training" and "boredom-busting" statements. In this question section, we received a conclusion that according to our participant, parents argued that games could improve children's creative thinking and improve children's vocabulary.

2.3. The result from the teacher questionnaire

According to the collected data, all teachers in this study own a smartphone and can use it well. Among the 35 respondents, 23 teachers own a PC/laptop, and four of them own iPad/tablet and video games console/portable at home. In terms of computer's daily use, 17 teachers use Personal Computer (PC)/laptop every day on working day, 13 teachers use it every day, three teachers rarely use PC/laptop (less than three days a week), and two teachers never use PC/laptop at work/home. Some teachers, 12 people, have tried to play games on iPad/tablet and other video games consoles.

In the school facilities context, 60% of teachers stated that their school has a multi-media room. Surprisingly, according to the school's equipment types, 85% of the school have laptops/PC with 71% have free internet access, and 66% of schools have audio speakers. It is a good number for the future of digital learning. Regarding teacher experience with game-based learning or gamification, 77% (28 people) of them claimed that they had tried games for learning activities. The reasons for using games to teach are (1) to attract student's attention by 40% of teachers; (2) to reduce student's boredom by 25% of teachers; (3) to improve student's motivation by 25% of teachers; and (4) to help student understanding by 10% of teachers.

Nevertheless, 23% of teachers who have never tried implemented games in class want to try using games in their classroom (both digital and non-digital) in the future. They have never tried to implement the game in their teaching method because they do not know how to apply games in the learning process. All the teachers agreed that the ideal time for digital learning is less than 2 hours per day. As an educator, teachers showed their concern toward game-based learning. About 42% of teachers worried about game addiction, 28% felt that technical problems would inhibit the process, and 14% argued about the uncertainty of the game's effectiveness.

From teachers' experience with games, they mentioned some non-digital games implemented, namely snakes and ladders, puzzles, guess the words, hopscotch, hide and seek, throw and catch, whisper challenge, and *gobak sodor*. Only three teachers tried digital games-based learning with free creative game design platforms like Quizizz and Wordwall. It is clear that most of the teachers still used traditional/ non-digital games for learning. On the other hand, we asked about their gamification experience in class with four-Likert scale questions. We had another issue in this session, not because of the neutral answer, but five teachers give only a "strongly disagree" answer for this question. We assumed that they might not understand the meaning of gamification (the learning approach uses game elements to motivate students in the learning process). Similar to the parent questionnaire, the teacher should answer the six statements from four Likert options. The question is "have you tried these gamification experiences?" with six statements : (1) reforming the learning material; (2) give feedback to student's work; (3) divide the class into groups; (4) show the student's grade like in a Classement; (5) arrange the material by the difficulty order; and (6) using quiz and giving a reward. To sum up, the teacher mostly agrees with gamification. It is indicated that most teachers have already had the experience of enhancing the learning experience with play.

Furthermore, we found it interesting one male teacher is a primary school graduate; he is in his 40's. Despite his educational background, he has more experience in using video game gadgets than others. One female teacher, who is in her 50's, doesn't use a PC/laptop in her daily life/work but is very enthusiastic to try using games in class. According to her answers, she traditionally teaches chalk and blackboard and rarely asks her student to participate in the learning process.

3. CONCLUSION

How teachers and parents look, deal with, and experience games could be the core of designing playful game-based learning with the Human-Centered Design's approach.

Parent's and teacher's dilemmas toward game-based learning show that they need to improve game literacy to prevent the game's negative assumption. Parent's and teacher's pivotal roles in children's Education should not be separated, which could be a novel concept in game design by combining their perceptions. Most parents allow their children to have screen time and even facilitate their children with gadgets. Their main concern for the children's game-time is the lack of social interaction, health issues, and digital addiction. Meanwhile, teachers worry about students' game addiction, but they want to use digital game-based learning in their classrooms. It is a contradictive act, in which we should have future study about teachers perceptions. In addition, even though teachers nowadays use computers and smartphones every day, they still feel uncomfortable using digital games in class.

Arguably, game-based learning can be an opportunity to empower teacher's existing identities so they become comfortable with and gain ownership over game-based learning. They need to take the role of co-developer/designer in the game design process of game-based learning so that the game will be more connected to them. On the other hand, some scholars agreed that despite the problems regarding game-based learning development, the recent rapid transformation of traditional learning to digital learning would be better with parent and teacher involvement and support. Future research is needed for a more significant number of teachers and parents in face-to-face interviews and focuses group discussions. The comprehensive questionnaires for parents and teachers could be conducted to build personas for upcoming game design research.

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