Determining the Effectiveness of Game-Based Learning through Educational Games: A Case Study in A Primary School

Hur Mustafa Yucedal[1]

[1]English Language Teaching Department, Faculty of Education, Tishk International University, Erbil, Iraq
Correspondence: Hur Mustafa Yucedal, Tishk International University, Erbil, Iraq.
Email: mustafa.yucedal@tiu.edu.iq

Abstract: Game-based learning has become an indispensable part of modern education. In particular, games that address the cognitive, affective, and psycho-motor aspects of students are important tools for effective learning. Games have some advantages in educational settings as well as some disadvantages. But for young learners, games have very vital functions. By adding the suspension factor to the content of the game used in this study, a game was played to the students and the test results and observations were evaluated. While this study draws attention to the positive aspects of the game, it also revealed some potential problems.

Keywords: Game-based Learning, Young Learners, Suspension Factor

1. Introduction

Game-based learning can give very effective results in educational settings. In order to achieve this, first of all, the games must be designed in accordance with the level of the students. In addition, the correct determination of the means and goals in the game determines the progress and effect of the game. The presence of the suspension factor in the game has the power to add a different dynamism to the game. What kind of results the games to be played by providing all these are evaluated in this study.

2. Games in Education

It is observed that in-class activities and educational settings show significant changes in modern times compared to traditional education methods. Although parents are traditionally responsible for their children's early educational supervision, in today's technological age, instructors are increasingly called upon to fill this role, as the student's universe of ideas is vastly different from that of the parent. This means that at this point in time, only properly trained educators are capable of connecting with their students (Yildiz, 2022). The teacher, who was the authority in traditional education, was presenting his knowledge to the students who passively sat before him. However, modern education methods are based on completely abandoning this understanding (Dimitrios et al., 2013). Accordingly, a student-centered education has emerged, and education is based on the student being active in the classroom. With this

change in educational settings, the process of adapting the games, which previously seemed frivolous and known only as children's activities, to educational environments has also begun (Jurakulovna et al., 2022). The realization of the effect of games at the point of increasing motivation, which is one of the most important elements of education, accelerated the adaptation of games to classroom activities (Papadakis, 2018).

It has also been determined that games have important effects on the physical and cognitive development of children, apart from being instructive. In addition, it has been observed that some strategic games significantly affect children's problem-solving abilities and socialization (Li & Cruz, 2008).

In addition, students take immediate action to see the mistakes they made during the game and to recover them. Thus, the need to use problem-solving skills effectively arises during the game. The game environments that students simulate outside of real-life help develop problem-solving skills in real life (Kiili, 2006).

After the realization of these effects of the games, the design of the games revealed further positive effects. For example, the difficulty levels in the games made it possible for the student to re-adapt according to his ability. Thus, it is promoted that students exhibit behavioral changes in the expected direction. It is seen that games improve some thinking, planning, and reasoning skills because they increase motivation (Ferdig, 2008).

It is possible to repeat and reinforce previously learned information in-game environments. Thanks to the active participation of the students in the game environments, students who remain passive in the classroom for various reasons or who are shy in character find more opportunities to benefit (Chen, 2016). Increasing students' interest in the course content can be possible thanks to the game. Once this interest is stimulated, more effective learning can be achieved in other lessons (Burguillo, 2010).

3. Game-based Learning

Game-based learning basically means that students learn by playing. It is one of the effective methods to be used to achieve predetermined educational goals. Thus, students think, act, and develop strategies to overcome the problem or obstacle placed in front of them in the game. Game-based learning can be understood as the student reaching the goal by using his previous knowledge and skills and learning new information in the meantime. There is complex content in the game such as making a plan before the game, implementing these plans in the game, offering alternatives, using one's own knowledge and helping others. In this case, students have the opportunity to learn both by experience and by observing, and they leave the traditional learning-by-heart method aside (Spires et al, 2011).

3.1 Advantages of Game-based Learning

Games perform many functions as the most serious element of children's life. They have many physical, mental, and psychological benefits. First of all, because games are interesting and motivating for children, they contain the most basic elements necessary for learning (Granic et al., 2014). Students, who cannot easily enter the learning process due to different psychological and mental disabilities, can create a learning environment for themselves thanks to games with high interest and motivation. Thanks to the game,

learning can be fun and enjoyable. The games designed in accordance with the cognitive development of the students improve their problem-solving skills. It also provides students with the opportunity to practice (Taskiran, 2019).

Games are a very effective tool to focus students' attention on a point. It also helps students enrich and reinforce their knowledge. It helps students with low achievement in the classroom to reach learning capacity close to others. Games can be arranged according to the level of each student. The atmosphere created during the game both encourages learning and removes stress. It is possible to use games in many cross-curricular activities. They can also offer immediate feedback for teachers. They ensure maximum participation of the students as well as allow the teacher to interfere with minimal or no intervention (McCallum, 1980).

3.2 Disadvantages of Game-based Learning

Digital games have only recently entered the mainstream, and now provide a viable means for young people to pass the time (Dayan & Yildiz, 2022). Hence, there are also some negative aspects of the games used in educational environments. First of all, it is a very time-consuming effort to prepare games with specific objectives suitable for students' levels (Karadag, 2015). Sometimes, extra investments may be required to ensure that the technological infrastructure of educational institutions is suitable for the games (Van Eck, 2006). Learning through games is a very time-consuming activity, and if it is used too much, there is a danger that the curriculum will not catch up. Therefore, while students learn one subject very well, they may not learn other subjects (Celik et al., 2022). In addition, teachers should have more control over students in game environments. Otherwise, the games may take a form other than their purpose (Hamid & Kapralos, 2009).

4. Games for Young Learners

The choice of games for children is an issue that requires a lot of attention. First of all, the purpose of the game and its suitability for the level of the children should be evaluated. In addition, what children will learn during the game should be determined correctly. Different problems arise when the games are not suitable for children's levels. Games above the children's level will reduce their success, while games below their level can reduce their interest and motivation (López-Faican & Jaen, 2020). Accordingly, students always need their teachers' guidance during these activities (Bilgin et al, 2022a; Bilgin et al, 2022b). Some features of the games prepared for children according to their content are remarkable.

1-) Information gap: These are games in which the information is missing between different situations and the student is asked to complete it.

2-) Guessing games: It is a type of game based on the guessing of others that the student knows in his mind.

3-) Search games: It is a game that requires the student to do research to find the necessary information.

4-) Matching games: These are games in which students compare different ideas, preferences, and possibilities.

5-) Collecting games: These are the games where students have to bring together different information or items to complete a series.

6-) Combining games: These are games played in the form of bringing together information that can be grouped with each other.

7-) Arranging games: These are games played in the form of students organizing the scattered information in their hands (Hadfield & Hadfield, 1990).

5. Methodology

5.1. Research Design

It is research-based on two students playing a game designed as a board game and measuring their learning levels. In this game, there are all activities that include cognitive, affective, and psychomotor domains. While there are questions that require the student to use their mental capacity, it is aimed to keep their motivation high through the competition. In addition, in this game that appeals to the kinetic aspects of the students, the students are asked to move and even dance when necessary. There is a design based on testing the tutorial aspect of a game in which all members are involved.

5.2. Sample

In this study, 6th grade students at a school were used. Since a board game prepared for the English lesson was applied to the students, these students were chosen as the most appropriate age group. Gender factor is not taken into account. For this game played with two people competing each other, 5 groups were formed, and 10 students were used.

5.3. Data Collection

In this study, data collection was provided by observing the performance of the students during the game and testing the information used in the game.

5.4. Findings

The name of the game used in this study is "food hobby". This game, which was designed as a board game, was prepared in accordance with the English level of the children and questions were formed from the materials they learned in the lesson.

5.4.1. How to play

This game is played with two people. Students take turns rolling the dice in their hands and progress through the squares in the game. They will progress by fulfilling the tasks requested from them in the square they came to. In this game where students will roll dice in turn, the bonus, which is also included in some squares, shows that the same student will roll the dice twice. There are some challenges in this game.

Drawing challenge: the student will take a picture from the drawing envelope and draw that picture. After completing this, the other player will continue.

Reading challenge: the student will draw a card from another envelope and do what is asked of him there.

Pointing: The student will have different pictures in his hand and his friend will tell him about one of these pictures. After finding the correct picture, the game will continue.

Choose three cookies: The student will take out 3 words from the envelope and make up a story consisting of them and tell this story to his friend.

Use a play dough: The student will make the object showing the word he has drawn from the envelope with play dough.

Potato granny: Here the student has 4 cards in front of him. He must choose one of them. Two of them are safe, one is a square jump, and one is a backward jump. Thus, luck and suspension factors have been added to the game.

Dance or five steps back: Here the student is asked to dance. If it doesn't, it will go back five steps. Thus, it was tried to address the kinetic aspects of the students.

Swap to nearest: The student has the chance to swap his/her place with another friend. If he is more backward than the other friend, he may want to switch places with him so that he can get ahead of his friend.

Choose a bomb: here the student will choose one of the 3 cards from the envelope. While 2 of these cards are safe, one of them has a bomb. If he chooses the safe card, he will continue on his way, but if he chooses the bomb, he will restart the game.

Hot dog challenge: here, the student will say the tongue-twister chosen from the envelope to the other friend accurately and quickly.

In addition, they were asked to form sentences in accordance with the desired tenses from the words given in different squares in the game. In some squares with irregular verbs, students were asked to say the 2nd and 3rd forms of the verbs. The student who reaches the end before the other will win the game.

5.4.2. Purpose of the Game

The main purpose of this game is to enable students to learn through play and to turn learning into fun. Colorful materials were used a lot in this activity, as they attracted the attention of the students. In addition, the students' four main skills were activated in this game. Students were asked to use imaginative skills and were encouraged to make up a story with the given words and think in English. It is aimed to contribute to the development of motor skills of students with play dough. In this game, students will not only learn, but also take risks. In addition, students were asked to choose one of the different options. Thus, students' critical thinking ability was addressed.

5.5. Evaluating the Test Results

In this game, a 20-question test consisting of words and sentences asked to the students was applied. The grades received by the students in this exam, which is evaluated out of a total of 20, are as follows.

Table 1-Test Results (out of 20)

	Mark
Student 1	20
Student 2	20
Student 3	20
Student 4	20
Student 5	19
Student 6	19
Student 7	18
Student 8	18
Student 9	18
Student 10	17

The 2nd and 3rd forms of the verbs asked to the students in the game were taken from their English coursebook and the relatively difficult ones were preferred. The students had difficulty in knowing some of them during the game, and they did not know some of them. However, since they remembered all these words after the game, they learned all of them by checking them. As a result, they got very high results in the exam. In addition, students were asked to make sentences suitable for tenses from the verbs given in the game. Although they had some problems during the game, they reviewed and learned all of them afterwards. Thus, they got high marks in the exam. An important reason why students get such high grades is their motivation during the game. Although they did not show the same performance in the game, they later checked and learned the questions they did not know due to the interest stimulated inside the students. Thus, they got high results in the exam. Therefore, students were encouraged to learn not only during the game but also after the game.

In addition, in the exam, students were asked to write down the stories their friends told them. Furthermore, students were also asked to write down the keywords used by their friends. As a result of the exam, all of the students remembered the keywords correctly and wrote the story correctly.

6. Discussion

This game was previously designed by others. However, many elements were added to the game according to what the students learned in the lesson and according to their level. It can be said that the students enjoyed the game during the game, because first of all, there was the suspension factor in the game. The students had to move backwards as well as front of their friends several times during the game. Therefore, their motivation in the game was quite high.

However, in some cases, disagreements arose, and it was necessary for the teacher to intervene. Therefore, the control of the teacher in the game is very important. Otherwise, they could not solve some problems among themselves.

During the playing of the game, it was tried to address both the cognitive, affective, and psycho-motor aspects of the students. The combination of these three elements has already made the game very attractive. It was both fun and instructive for the students to tell a story from the words they chose because the student used both his English and made up a new story here.

In some cases, students were asked to stand up and dance. While some students did this easily, some shy students agreed to go back 5 squares in the game. Some other students, despite their hesitation, agreed to dance because of their motivation in the game.

In this game, in which the luck factor was very effective, the students fell behind while they were in the position of winning different times, and those who were behind, likewise, moved forward. It should be noted that the suspension factor here makes the game very attractive. However, in some cases, high tension can cause some friction. Therefore, it is very important for the teacher to control and intervene immediately and solve the problem as a referee.

Students were asked to make an object using play dough. It has been observed that some talented students have produced quite good results here. Likewise, it was observed that other students were also willing to pass this stage.

It was quite interesting when the students uttered the tongue-twisters they chose from the envelope. Students mostly made mistakes here and laughed together at the mistakes they made. This was treated as a tension lowering factor.

An important aspect of this game that should be noted is that it encourages students to learn after the game. They tried to learn many questions that they did not know during the game by asking each other later on or by referring to their coursebooks. Thus, they got very high results in the exam. In addition, it can be said that the students achieved a very successful result in writing the story and remembering the keywords. With the motivating effect of the game, students both remembered the story correctly and wrote the keywords correctly.

7. Conclusion

The motivating effect of games has been noted many times in the ELT literature. Therefore, if designed correctly, the games have both fun and educational aspects. The difficult point for the teacher is to design

the games in accordance with the level of the students. One of the most important factors in the game is the suspension factor because even students who are about to lose the game know that the luck factor will change the winner. Therefore, students maintain their motivation until the end of the game. Otherwise, it is normal for the students to lose their motivation. It is also important to construct games that will appeal to different aspects of students. Stages that require action increase their motivation. It has also been seen in this study that games that appeal to different aspects of students and force them to be constantly active gave more effective results, as opposed to the alternative of playing the games on the table in an inactive way.

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