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The degree of application of the gamification strategy and the obstacles to its application from the point of view of early childhood teachers in the Al-Ahsa city

Dr. Aida Theeb Mohammad

Associate Professor - Department of Kindergarten - King Faisal University, amohammad@kfu.edu.sa

Abstract

The study aimed to show the extent of application of the gamification strategy and the obstacles to it from the point of view of the early childhood stage teachers in Al-Ahsa Governorate according to the variables (years of experience, educational stage, training courses). The study uses the mixed approach to collect quantitative data by means of interview and a questionnaire consisting of (45) items distributed on the five principles of the gamification strategies to collect the qualitative data. The results of the study showed that the degree of application of the gamification strategy in the study sample was very high. Also, there were no differences due to the variable of the educational stage, and there were statistically significant differences attributed to the variable of the training courses and in favor of the female teachers who enrolled in the training courses. That the most prominent obstacles to the use of gamification strategy is the lack of an Internet network that enables female teachers to use technologies in the educational process.

key words: Gamification strategy, early childhood, elements of gamification application, application obstacles and training Courses.

Introduction

The current era is facing a fast scientific and information development in all areas of life, including education, which made the teachers of the current era face the challenges of this technological and technical speech and shift to the use of modern strategies. These strategies contribute to raising the motivation of learners. It also develops their skills. This motivation is in response to the vision of the Kingdom of Saudi Arabia 2030. This vision calls for an aware generation in a knowledge-based society possessing the cognitive and technical skills that are the basis for the learner to be able to process sensory information.

In this regard, Al-Ghamdi (2018)stated that learners who receive information and the teachers who are not keen on using modern technologies that contribute to creating an educational environment rich in creative activities that motivate learners and contribute to improving their learning outcomes leads to making them possess negative attitudes towards learning. From here, modern trends have emerged that call for the importance of shifting from the traditional role to keeping pace with technological acceleration through the use of modern strategies and educational games. These games increase the learner's motivation to learn and engage them in scientific content in a manner that suits their nature and mental, physical, and social development in an enjoyable way. Gamification is one of the modern methods in the field of education because it gives the learner an opportunity in controlling learning in and reduces failure and fear, motivating the learners for continuous self-learning and linking education to real life(Al-Qaed, 2015).

Many studies have shown the role of gamification strategy in the success of the educational process by improving the stimulating interactive environment that helps the learner to interact with educational situations that achieve purposeful activity(Hamid, 2017). Gamification is not an electronic game, but rather a practical game that uses the ideas and principles of play to increase the interaction and participation of learners in learning environments. It is based on a number of concepts such as motivation, motivation, effectiveness and immediate feedback(Al-Mutairi, 2021).

Aşıksoy (2018)emphasizes that gamification is a concept capable of increasing the motivation of learners towards learning and acquiring various knowledge and skills. This is because it increases the level of learners cognitive and skill because of the collection of signs and points in addition to containing challenges, levels and skills that learners must master through their positivity towards learning and their sense of interaction and competition.

Because of the importance of gamification in the educational field as one of the effective educational methods, the current study seeks to reveal the degree of gamification strategy application the problems it faces obstacles according to the study sample.

The Questions of the Study

1- What is the degree of application of the gamification strategy from the point of view of early childhood teachers in the Al-Ahsa city?

2- What are the statistically significant differences at the level of significance (0.05 = α) in the mean responses of the study sample members due to academic stage, training courses, years of experience?

3- What are the obstacles to applying the gamification strategy and according to the early childhood teachers in Al-Ahsa?

Objectives of the study

The current study aims to:

1- Detecting the degree of the application of the gamification strategy from the point of view of early childhood teachers in Al-Ahsa.

2- Showing the differences in the extent of applying gamification strategy by the study sample according to school stage, training courses and years of experience.

3 – Diagnosing the obstacles to apply the gamification strategy from the point of view of the study sample.

The importance of the study

The current study can contribute to:

- The current study provides to Arab Library new knowledge related to the gamification strategy. This study is - to the researcher's knowledge - the first in the fields of gamification and on a sample of early childhood teachers in its two categories (kindergarten and primary grades)

- Directing the attention of curriculum designers for the kindergarten stage to include activities based on the gamification strategy and similar strategies that contribute to improving the educational process. It makes it more enjoyable and useful and raises the level of technical and performance efficiency of learners to achieve the goals of the Kingdom's Vision 2030. This vision calls for the significance of the use of the modern methods and techniques in the learning process, which the student should be centered.

The study was limited to the following limits:

- Objective limits: the degree of application of the gamification strategy among early childhood teachers in the Al-Ahsa city.

- Time limits: the second semester of the academic year 1444 AH

- Human Limits: early childhood teachers in Al-Ahsa city.

- Spatial boundaries: This study was applied in Al-Ahsa city, Kingdom of Saudi Arabia.

Terminology

Gamification: It is defined as an educational and training approach that contributes to motivating learners to pursue educational tasks using game elements in learning environments in order to maximize participation, fun and benefit(Huang & Soman, 2013).

Gamification strategy: It is defined as an educational strategy through which the teacher can use technology as a tool to present the content of the experience through multimedia (moving image, sound, static, written text). The teachers can also present it in the form of a set of questions. So the role of the teacher is to follow the learners individually or collectively through a specialized display screen and motivate them and feedback them(Al-Far, 2004).

It is defined procedurally as a set of procedures that contain the characteristics of the game and planned and followed in providing educational content using multimedia and game elements. These elements may include rewards, competition, stages and challenge tasks aimed at increasing the motivation of learners.

Obstacles: Obstacles are defined as all administrative, material, subjective and methodological difficulties. The obstacles also include the problems that the educational research has to do and prevent the benefit of the results of this research in the development of education and training(Al-Mulla, 2007). Al-Abdan and Al-Qarni (2021)define it as everything that negatively affects and hinders the application of science to the gamification strategy, and prevents the achievement of the desired goals in the educational conciliator.

Procedurally, they are the obstacles that prevent the use of the gamification strategy for the achievement of the objectives of the implementation of educational content and are identified through interviews conducted by the researcher with the teachers of the study sample.

Theoretical framework and previous studies

The concept of gamification

There are many definitions and translations of the concept of gamification according to the orientations of researchers and those interested in it. D (2014) defines it as the use of game elements and design mechanisms in situations unrelated to games. According to Al-Ghamdi (2018), it as a method in which game elements are used to collect points, levels, rewards and badges in a way that contributes to breaking boredom and achieving planned goals.

Gamification elements

Many educational studies that dealt with the subject of gamification pointed to some elements that can be used in the educational process. These elements can be leaderboards that show learners their names and points they have obtained and allow them to know their positions in relation to others, which motivates the learner to develop his levels

and position among others to maintain the lead, and the leaderboard lists are among the actors contributing to increasing the degree of self-motivation among learners(De Byl, 2013).

Another gamification element is "scores", which are given to the learner in a specific and agreed manner according to the nature of the course and the teacher's planned targeted learning outcomes. According to Al-Qaed (2015), one of the elements of canning is also "levels" which is the stage the learner reaches when completing a specific task. The element of levels contributes to finding a logical sequence of experiences that must be passed(Al-Malah, 2016). Another element of gamification that contributes to learners' knowledge of what they have learned and what they should learn is "feedback".

Also, "medals" are a set of digital icons given to the learner when reaching a specific standard. They increase motivation to achieve the desired goals. The medal is awarded if the learner completes the task before the specified time or if his/her participation is effective(Al-Abdan & Al-Qarni, 2021).

In order for the elements of gamification to achieve the desired goals, it is recommended to employ them when implementing educational content and the desire to achieve the planned goals.

Steps to implement gamification in education(Asmaa, 2022)

The process of implementing the gamification strategy in the educational process is a purposeful and planned process and proceeds based on the following steps:

- Setting goals: This step is the first step, as at this stage the goals are formulated and arranged according to priority.

- Identify the targeted behaviors: At this stage, it is necessary to concentrate on the needs of learners by identifying behaviors that achieve the goal in total.

- Classification of players: At this stage, participants are divided into four different segments to showing the motivations that contribute to increasing learners' motivation.

- Identify learning resources and means: At this stage, the teacher's role is to prepare sources for the means he wishes to use, which he will use to gamify the educational content and the environment.

- Introducing fun and entertainment: This step is important because the most important elements of gamification is to move away from stereotypes in performance and shift to fun and entertainment despite the disappearance of external stimuli for the learner.

- Selection of appropriate elements and techniques: At this stage, the findings of the data of the previous stages are employed in the selection of the techniques used in proportion to the implementation of the educational content.

It is noted through the previous elements that employing them when implementing educational content contributes to achieving many goals. Thus, the teachers need continuous feedback in order to fill the gaps that they may get after implementing the previous steps.

The importance of applying the gamification strategy in early childhood

The application of the education strategy in the educational process achieves many benefits such as attracting the attention of learners and increasing their interaction with the educational content. This leads to increasing their motivation towards learning, and retaining learning for a long time. It also makes the learner's positive towards learning because of their prior knowledge that s/he will receive incentives and rewards, which contributes to achieving the planned goals.

Brophy (2015) asserted that gamification strategies are important in the learning process because they help in developing the learners' thinking abilities, skills, and roles in promoting teamwork. These strategies increase the ability to solve problems and achieve fun for learners.

Principles of employing gamification in the educational process

Several studies (Al-Abdan & Al-Qarni, 2021; Huang & Soman, 2013) have pointed to the principles that can be employed when implementing a gamification strategy:

Understanding the characteristics of the target group and the learning conditions surrounding them: in order to help understand them and know the age group to which they belong its characteristics identify the learners' abilities, skills and needs to determine the type of program. This program will be offered to them and the duration of its implementation. It will identify the appropriate environment for its implementation.

Determining the objectives and outcomes of learning: the learners completes the tasks they started with and achieves the general objectives and procedural objectives of the game.

Choosing the appropriate gamification elements for the abilities and levels of learners: In the sense that teachers begin to display the easiest and clearest stages for learners, which generates an incentive for them to continue learning with pleasure. They take into account that the game is not very easy so as not to lead to boredom. It is

preferable that the game is not with a high degree of casting so that learners do not generate anxiety and withdrawal due to the inappropriateness of the game to their abilities.

Identifying resources: Here it is necessary to clearly define the instructions for the game as well as determine its levels, taking care of a method to measure the progress of learners in the game and the level of progress in addition to feedback.

Application of gamification elements: It ensures self-elements such as points, badges, levels and achievements that motivate learners towards competition. It also achieves individual achievements resulting from their self-challenge, and social elements such as team spirit, competition and cooperation between learners to achieve general achievements and common progress.

Obstacles to the implementation of the gamification strategy in educational situations

Although gamification strategy is characterized by many features that make it an effective strategy in the teaching and learning process, some teachers prefer not to use due to several reasons: obstacles such as teachers' lack of knowledge of the correct gamification concept or the teachers realize that it is a strategy based on play(Jenkins, 2016). Other reasons are: poor implementation and the teacher's inability to possess the skills to implement it, the content of the same experience is not suitable for the abilities of all learners, or the nature of competitive game systems that make some Learners anxious and increasing the burden on teachers as a result of their need to monitor, manage and process systems for this strategy (Brophy, 2015). In order to overcome the challenges and obstacles facing the implementation of the gamification strategy, Al-Salami (2019)indicated that the teacher can overcome these obstacles and challenges by designing educational programs based on the gamification strategy and taking into account the steps and principles of implementing this strategy, such as taking into account the capabilities and characteristics of the target group. They can link rewards to outstanding performance, and cooperate with specialists in designing educational content and implementing targeted training courses that clarify the mechanisms for using this strategy.

Previous studies

Studies related to the study variables will be dealt with in order from oldest to newest.

Alomari, Al-Samarraie, and Yousef (2019) conducted a qualitative study to show how can gamification technology encouraging student learning in Malaysia, using the descriptive approach. They used the descriptive analyses and report review, and (40) study groups were

identified in the methodological process. The results indicated that gamification techniques affect student learning, so learners must be directed to use gamification before starting an educational task.

Al-Nadi (2020) investigates the impact of the use of play on developing creative thinking skills of third grade students in science in the capital, Amman. A semi-experimental approach was used and the study sampled (134) male and female students and randomly divided them into: experimental and the other control groups. The study pointed to the effectiveness of the gamification strategy in developing creative thinking skills, and the study recommended gamification in teaching science because of its importance.

Shaheen (2020) revealed the effectiveness of a gamification strategy designed by applying Klas Dojo. This strategy is to manage the classroom and extracurricular learning environment through an electronic monitoring list using the Class Dojo application to explain the performance of a sample of third grade students at Al-Islah Primary School common. The data were collected and analyzed statistically. It is found that the gamification strategy designed by applying the Dojo class in managing the classroom, extracurricular and home learning environment was effective in improving the academic performance of the sample members.

Marín-Díaz, Sampedro-Requena, Muñoz-Gonzalez, and Jiménez-Fanjul (2020) aimed to show the opinions of the study sample on the use of gamification in the classroom as one of the methodological tools contributing to developing the mathematics curriculum at this stage. The quantitative descriptive approach was utilized to collect data from members of a sample consisting of (232) students enrolled in the Faculty of Education, University of Cordoba. According to the findings, the vision of the specialists of the study sample confirmed the possibility of using gamification because it constitutes one of the sources of learning the content of mathematics courses, and the results indicated that there is no effect of age and gender variables on determining the gamification use perception in the classrooms for early childhood.

Al-Abdan and Al-Qarni (2021)showed the extent of applying gamification in teaching science and the obstacles to apply it by female teachers in the city of Makkah. The researchers used the parallel convergent approach, and the questionnaire to collect data after ensuring its truthfulness and stability. The questionnaire was distributed to a sample of (200) female teachers, and interviews with (6) people. The results indicated that the degree of use of the study sample teachers for the gamification strategy in the educational process came to a medium degree with obstacles ranging from medium to high due to administrative and other reasons related to the

teacher. The interviews confirmed the results of the questionnaire. The researchers recommended the importance of ensuring the use of gamification method in science education because of its importance in creating an interactive learning environment that is fun and interesting. They also stated that it is necessary to equip schools with the requirement of teaching by gamification.

Al-Otaibi (2021) explored the application extent of the gamification strategy among computer teachers in the Riyadh region in the Kingdom of Saudi Arabia and showed the obstacles to its application based on educational qualification, years of experience, and school stage. The researcher used the descriptive analytical approach, and the questionnaire consisting of three main axes to collect data after ensuring its truthfulness and stability. The study sampled (780) female teachers, and the study showed that the degree of application of the gamification strategy among the study sample was large and the obstacles associated with school administration and material capabilities was first followed by the obstacles associated with the curriculum and then the obstacles associated with the teacher.

Al-Gazzar, Awad, and Wahab (2022)developed an e-learning environment based on the gamification strategy to improve the mathematics skills of the kindergarten child. It used the descriptive approach to prepare the theoretical framework, the study tools and the experimental approach to verify the validity of hypotheses and the effectiveness of the independent variable. It also uses testing as a tool to measure the mathematics skills necessary for second-level kindergarten children. The study sampled (60) boys and girls distributed into two groups: experimental and control. The results indicated the effectiveness of developing an e-learning environment according to the gamification strategy to develop mathematics skills for kindergarten children. There were differences between the average scores of the experimental group in the cognitive and performance aspect of mathematics skills in the pre- and post-test in favor of the later in testing kindergarten child in the math skills.

So, the current study is significant because it aims to identify the extent of applying gamification strategy and the obstacles to its application by a sample that constitutes an important and basic segment in the educational system. Also, the current study is the first - to the best of the researcher's knowledge - that studied the variables subject of the current study as the researcher benefited from past scholarly works in building the theoretical literature, the current study tool, statistical analysis and determination of the study methodology, as well as in discussing the results reached in the current study .

The method of research

The researcher adopted the mixed approach in parallel design which is the approach in which quantitative and qualitative data are collected. The data is integrated through a research design that mixes quantitative and qualitative approaches.

The Study population

The population of the study was all early childhood teachers in Al-Ahsa city for the second semester of the academic year (1443-1444) numbering (5703) according to the latest statistical data of the Department of Education for the year 1443-1444 AH

Study Sample

Survey sample: The survey sample consisted of (20) parameters to ensure the validity and stability of the tool.

Study sample (basic): The method of the facilitated sample (available) was used. Here, the research tool was converted after arbitration to an electronic link and circulated to the target group and the number of responses was (389) teachers. Also, table (1) is the distribution of the sample according to the variables:

Table (1) Distribution of the study sample by variables

M	Variable	Category	Iteration
1	Experience	Less than 5years	183
		from 5 to 10	157
		More than 10	49
2	Stage	Riyadh	223
		Elementary Classes	166
3	Training	Receive training	123
		You did not receive training	266
	Total		389

The study Tool:

To achieve the objectives of the study, the researcher used the following tools:

The questionnaire was built after referring to the theoretical educational framework and previous studies to collect quantitative data. The data consisted of (45) phrases distributed on the principles of the five gamification strategy (understanding the target audience and context, determining learning objectives, organizing educational experience and content, identifying resources, elements of application of gamification). The response to the items was to the approval extent based the Likert pentagonal scale.

The researcher also used the interview to collect qualitative data after implementation with (8) specialized teachers in early childhood. These teachers were asked about the gamification strategy significance and obstacles to its use in the educational process, and record responses and coding in order to analyze and benefit from their results.

Honesty and consistency

Honesty of the tool:

The researcher verified the validity of the study tool (questionnaire) through:

A- Apparent honesty (arbitrators):

After the researcher finished preparing the initial form of the study tool, she presented it to some faculty members with experience and specialization, and their number reached (10) arbitrators. Their guidance and suggestions were followed such as adding new and appropriate phrases to the axis to which they belong, the language integrity and its freedom from spelling, linguistic and typographical errors, according to the opinions of the arbitrators.

B. Sincerity of consistency:

The researcher applied the study tool in its shape after arbitration on the exploratory sample consisting of (20) female teachers. We measured Pearson correlation coefficient between the items of the degree of application of the gamification strategy from the point of view of the samples with the total degree of the axis, and between the phrases and axes with the total degree of the tool (table 2).

Table (2): Pearson correlation coefficients between the items of the degree of application of the gamification strategy with the total score of the axis to which they belong, and between the items and the axes with the total score of the strategy

No.	Principles – items	Correlation coefficients with the axis	Correlation coefficient with the total score
	First Theme: Understanding the Target Audience and Context	1	.982**
1	Make sure to present the learning content through a simplified presentation (from easy to difficult)	.789**	.828**
2	I design learning content in a fun scientific way	.875**	.853**
3	I make sure to capture the attention of learners using the principles of gamification	.786**	.782**
4	Provide educational content appropriate to the interests and abilities of learners	.739**	.683**
5	Use methods that are compatible with learners' characteristics in educational situations	.503*	.457*
6	Take into account the type of teaching most appropriate to achieve the goal (individual - group)	.823**	.827**
7	I design content that takes into account the individual differences between learners	.694**	.680**
8	I implement the pre-assessment to reveal the previous experiences of learners	.792**	.785**
	Second Theme: Setting Learning Objectives	1	.980**
9	Make sure to formulate the procedural objective clearly and precisely defined	.792**	.828**
10	Formulate the procedural objective in a way that accurately reflects what the learner should do	.880**	.827**
11	I set goals for each task	.792**	.828**
12	I am keen to formulate goals of educational importance to learners	.778**	.707**
13	Make sure to formulate realistic, achievable goals	.666**	.719**
14	Determine the time required to achieve the goal	.918**	.899**
15	I set goals that contribute to the discovery of higher order thinking skills	.907**	.860**
16	Make sure that the objectives are linked to the evaluation mechanisms followed	.918**	.899**
	Third Theme: Organizing Educational Experience and Content	1	.945**

17	I define the necessary rules for the implementation of educational content	.749**	.625**
18	Make sure that the educational content includes up-to-date and documented information	.754**	.842**
19	Divide the educational content into stages and stages into tasks	.845**	.683**
20	Make sure you provide linguistically correct educational content	.768**	.774**
21	Make sure that the educational content covers all the concepts and objectives it contains	.717**	.663**
22	I present educational content in a way that allows learners to interact with it	.699**	.719**
23	Take into account the interdependence and complementarity of the experiences provided by the educational content	.840**	.766**
	Fourth Theme: Identifying Resources	1	.966**
24	Determine the level of each stage of activities and tasks	.829**	.842**
25	I give learners the right encouragement and motivation at the right time	.786**	.815**
26	Provide reinforcement appropriate to the nature of the educational task	.731**	.727**
27	Include the difficulty of the questions accompanying each task or activity	.552*	.739**
28	Show display the desired educational content with a clear screen	.769**	.687**
29	Use clear, appropriately sized fonts	.657**	.744**
30	Make sure to provide clear images that are not cluttered with details	.769**	.687**
31	Make sure to present images in realistic colors that are relevant to the topic	.679**	.616**
32	Make sure to deliver clear, close-to-nature sounds	.894**	.873**
33	I offer learners rewards that contribute to making learning more enjoyable	.678**	.667**
	Fifth Theme: Elements of Gamification Application	1	.935**
34	I determine for the learners the mechanisms of the game and its objectives	.941**	.873**
35	I take into account presenting characters that attract the attention of learners	.629**	.692**
36	Give learners the opportunity to control the choice of characters they want	.794**	.639**
37	Make sure that the e-learning environment contains semantics for the symbols and shapes used	.674**	.561*

38	I encourage the atmosphere of competition between learners	.675**	.521*
39	I encourage learners to progressively with badges	.664**	.500*
40	The oldest work interfaces that illustrate the targeted educational environment	.720**	.635**
41	Be sure to display interaction interfaces that contain instructions for learners	.832**	.899**
42	Design achievement badges that express the degree of achievement of the learner	.777**	.828**
43	Use symbols that express the learner's success and others that express loss	.712**	.724**
44	Make sure to display interaction interfaces that allow the learner to register their data	.488*	.508*
45	I provide feedback at the end of each learning assignment	.601**	.664**

** Statistically significant at (0.01), * Statistically significant at (0.05)

Table (2) is the Pearson correlation coefficients of the item extent of applying the gamification strategy with the total degree of the axis belonging to it are statistically significant at the level of significance (0.01), (0.05). Also, the Pearson correlation coefficients between the statements with the total degree of the axis ranged between (0503* - 0). 941**) and all of them are statistically significant at the level of significance (0.05), (0.01). The Pearson correlation coefficients ranged from the items of the extent of applying of the gamification strategy with the total degree of the tool between (0.508 * - 0.899 ** *), which is statistically significant at the level of significance (0.01), (0.05) and the Pearson correlation coefficients ranged between the total degree of the axes and the total degree of the tool between (0.935** - 0.982** **). All of them are statistically significant at the level of significance (0.01).

Stability of the study instrument:

To confirm its stability, the study tool is applied to the survey sample consisting of (20) female teachers using the stability using - the Alpha Cronbach equation. Here, the stability coefficients were calculated on the axes of the study tool and on the total degree of resolution, and Table (3) shows the stability coefficients.

Table (3): Cronbach alpha stability coefficients for the axes of the study tool and on the total degree

No	Axis	Number of phrases	Stability coefficient
1	First Theme: Understanding the Target Audience and Context	**8**	**0.89**
2	Second Theme: Setting Learning Objectives	**8**	**0.93**
3	Third Theme: Organizing Educational Experience and Content	**7**	**0.88**
4	Fourth Theme: Identifying Resources	**10**	**0.91**
5	Fifth Theme: Elements of Gamification Application	**12**	**0.90**
6	**Overall Score**	**45**	**0.96**

Table (3) showed that the coefficient of alpha Cronbach on the total score was (0.96). Also, the stability coefficients on the axes ranged between (0.88 – 0.93), which are high stability coefficients suitable for the research aims, which indicates that the study tool enjoys stability.

Statistical processing:

The statistical software (SPSS) adopted version (23) in analyzing the results of the study and answering its questions were used:

- Pearson's correlation coefficient to verify consistency truthfulness

- Cronbach Alpha to check the stability of the study instrument

- Arithmetic averages, standard deviations and rank to answer the first question: What is the degree of application of the gamification strategy from the perspective of early childhood teachers in Al-Ahsa city?

The following scale was adopted for the degree of achievement of the items and axes of the study tool to determine the degree of approval based on the range equation. Also, the value of the arithmetic mean was explained and the approval score was determined according to the gradient:

(1 to 1.80) Very weak approval, (greater than 1.80 to 2.60) Weak approval, (greater than 2.60 to 3.40) medium approval, (greater than 3.40 to 4.20) large approval, (greater than 4.20 to 5.00) Very large approval.

Test T according to the stage and training variable, and analysis of single variance according to the experience variable are used to answer the third question: Are there statistically significant differences at the level of significance (0.05 = α) between the averages of the

sample responses, which are attributed to variables (years of experience, school stage, training courses)?

The results, interpretation and discussion

The results of the first question: What is the extent of application of the gamification strategy from the sample perspective?

The researcher calculated the arithmetic mean and the standard deviations of the responses of the study sample members to the degree of application of the gamification strategy from the point of view of early childhood teachers in Al-Ahsa city as table (4) shows:

Table (4): Arithmetic mean, Standard Deviations and Rank for the Degree of application of the gamification Strategy from sample perspective

No	Principles - items	Arithmetic averages	Standard deviations	Rank	score
	First Theme: Understanding the Target Audience and Context	4.44	.666	4	Very high
1	Make sure to present the learning content through a simplified presentation (easy to hard)	4.55	.747	3	Very high
2	I design learning content in a fun scientific way	4.32	.716	7	Very high
3	I make sure to capture the attention of learners using the principles of gamification	4.12	1.067	8	High
4	Provide educational content appropriate to the interests and abilities of learners	4.62	.738	2	Very high
5	Use methods that are compatible with learners' characteristics in educational situations	4.67	.707	1	Very high
6	Take into account the type of teaching most appropriate to achieve the goal (individual - group)	4.44	.819	5	Very high
7	I design content that takes into account the individual differences between learners	4.37	.809	6	Very high
8	I implement the pre-assessment to reveal the previous experiences of learners	4.44	.773	4	Very high
	Second Theme: Setting Learning Objectives	4.54	.678	3	Very high
9	Make sure to formulate the procedural objective clearly and precisely defined	4.74	.685	1	Very high

10	Formulate the procedural objective in a way that accurately reflects what the learner should do	4.73	.685	2	Very high
11	I set goals for each task	4.58	.878	5	Very high
12	I am keen to formulate goals of educational importance to learners	4.67	.764	4	Very high
13	Make sure to formulate realistic, achievable goals	4.70	.757	3	Very high
14	Determine the time required to achieve the goal	4.27	.893	7	Very high
15	I set goals that contribute to the discovery of higher order thinking skills	4.19	.819	8	Large
16	Make sure that the objectives are linked to the evaluation mechanisms followed	4.47	.726	6	Very high
	Third Theme: Organizing Educational Experience and Content	4.58	.653	1	Very high
17	I define the necessary rules for the implementation of educational content	4.63	.716	4	Very high
18	Make sure that the educational content includes up-to-date and documented information	4.48	.775	6	Very high
19	Divide the educational content into stages and stages into tasks	4.35	.860	7	Very high
20	Make sure you provide linguistically correct educational content	4.74	.685	1	Very high
21	Make sure that the educational content covers all the concepts and objectives it contains	4.67	.708	2	Very high
22	I present educational content in a way that allows learners to interact with it	4.56	.773	5	Very high
23	Take into account the interdependence and complementarity of the experiences provided by the educational content	4.64	.716	3	Very high
	Fourth Theme: Identifying Resources	4.56	.681	2	Very high
24	Determine the level of each stage of activities and tasks	4.27	.938	10	Very high
25	I give learners the right encouragement and motivation at the right time	4.67	.707	2	Very high
26	Provide reinforcement appropriate to the nature of the educational task	4.63	.716	4	Very high
27	Include the difficulty of the questions accompanying each task or activity	4.68	.707	1	Very high
28	Show display the desired educational content with a clear screen	4.55	.780	7	Very high

29	Use clear, appropriately sized fonts	4.62	.715	5	Very high
30	Make sure to provide clear images that are not cluttered with details	4.60	.769	6	Very high
31	Make sure to present images in realistic colors that are relevant to the topic	4.64	.764	3	Very high
32	Make sure to deliver clear, close-to-nature sounds	4.52	.775	8	Very high
33	I offer learners rewards that contribute to making learning more enjoyable	4.44	.773	9	Very high
	Fifth Theme: Elements of Gamification Application	4.34	.741	5	Very high
34	I determine for the learners the mechanisms of the game and its objectives	4.63	.764	2	Very high
35	I take into account presenting characters that attract the attention of learners	4.56	.773	3	Very high
36	Give learners the opportunity to control the choice of characters they want	4.11	.903	11	Large
37	Make sure that the e-learning environment contains semantics for the symbols and shapes used	4.44	.822	4	Very high
38	I encourage the atmosphere of competition between learners	4.33	.756	6	Very high
39	I encourage learners to progressively with badges	4.25	.877	8	Very high
40	The oldest work interfaces that illustrate the targeted educational environment	4.36	.946	5	Very high
41	Be sure to display interaction interfaces that contain instructions for learners	4.22	.988	9	Very high
42	Design achievement badges that express the degree of achievement of the learner	4.28	.932	7	Very high
43	Use symbols that express the learner's success and others that express loss	4.16	1.055	10	Large
44	Make sure to display interaction interfaces that allow the learner to register their data	4.10	.950	12	Large
45	I provide feedback at the end of each learning assignment	4.67	.756	1	Very high
	Overall Score	4.48	.637		Very high

Table (4) shows that the total degree of applying the gamification strategy from the perspective of the study sample is very large. The arithmetic mean was (4.48) and a standard deviation (0.637), and the first axis was understanding the target audience and context in fourth place with an arithmetic mean (4.44) and a standard deviation (0.666) at a very high score. The arithmetic mean on the axis phrases ranged between (4.12 – 4.67). The second axis determining the learning

objectives was the third with an arithmetic mean (4.54) and a standard deviation (0.678) and produced a high value. Also, the arithmetic averages on the items of the axis ranged between (4.19 – 4.74). Third axis was organizing educational experience and content ranked first with an arithmetic mean (5.58) and a standard deviation (0.653) and had a very large degree. The arithmetic averages on the items for this axis ranged between (4.35 – 4.74). The fourth axis determining resources was the second with an arithmetic mean (4.56) and a standard deviation (0.681) and scored very high. Also, the arithmetic averages on the items of this axis ranged between (4.27 – 4.68). The fifth axis, the elements of gamification application was fifth and last with an arithmetic mean (4.34) and a standard deviation (0.741) and showed a very high score, and the arithmetic averages on the items of this axis ranged between (4.10 – 4.67).

It is clear through the analysis of the responses to the first question that the use of gamification strategy was very large. So, it is important to use this strategy and the interaction and fun it achieves. It increases in motivation during the learning process as an effective strategy in attracting the attention of learners and facilitating the process of learning and absorbing the content of the experience. Also, there is an element of suspense, competition and challenge between learners that encourages learners to learn in a way that is far from routine and boredom and this result goes in line with Al-Abdan and Al-Qarni (2021); Al-Nadi (2020) where they pointed to the effectiveness and gamification strategy significance in teaching.

In the interest of the researcher to confirm this result, an interview was carried out with (8) teachers, where they were asked the following question: What is the application extent of the gamification strategy in the learning process from your perspective? Their answers confirm their keenness to implement the gamification strategy when organizing the experience and educational content because it enables them to prepare the necessary rules for its implementation and keeps them away from randomness. The two teachers (1 and 5) indicated that they are keen to use this strategy because it enables them to provide the content of the experience in the form of stages and tasks in a coherent manner that pleases the learners. As for the teacher (2), she confirmed that she is keen to apply it in the field because it helps learners to interact with it and provides them with incentives and encouraging signals to learn. Yet, teacher (3) stated she is keen to apply the gamification strategy because it is a modern method through which individual differences between learners can be taken into account from the implementation of experience and educational content, and teachers (4 and 6) confirmed that they are keen to apply the gamification strategy because it makes them display sounds and images close to reality, which facilitates the learner's interaction enthusiastically. Two teachers (7 and 8) were keen to implement it in

educational situations because it enables them to provide characters that attract the attention of learners and give them the space to control the choice of characters they desire with pleasure. Thus, the opinions of the teachers are compatible with the results obtained through the questionnaire, which confirmed that the study sample teachers were happy to apply the canning strategy in the learning process as one of the strategies that keep pace with scientific and technical development. This result is consistent with Al-Abdan and Al-Qarni (2021), and proved that the teachers were eager to apply the gamification strategy due to its importance and usefulness in achieving the desired goals.

The results of the second question: What are the statistically significant differences at the level of significance (0.05 = α) between the averages of the responses of the study sample on the bases of academic qualification, training courses, years of experience?

First: Variable of the academic stage

The researcher used the test (T) to show the significance of the differences between the arithmetic mean of the degree of application of the gamification strategy from the perspective of the study sample based on the stage variable as Table (5) shows:

Table (5): Test (T) to show the significance of the differences between the arithmetic averages of the degree of application of the gamification strategy from the perspective of the study sample based on the stage variable

Axis	Stage	Number	Arithmetic averages	Standard deviations	T	Degrees of freedom	Significance
First Theme: Understanding the Target Audience and Context	Riyadh	223	4.44	.626	-.197-	387	.844
	Elementary Classes	166	4.45	.719			
Second Theme: Setting Learning Objectives	Riyadh	223	4.42	.648	-4.426-	387	.000
	Elementary Classes	166	4.72	.681			
	Riyadh	223	4.59	.602	.376	387	.707

Third Theme: Organizing Educational Experience and Content	Elementary Classes	166	4.57	.718			
Fourth Theme: Identifying Resources	Riyadh	223	4.60	.638	1.200	387	.231
	Elementary Classes	166	4.51	.735			
Fifth Theme: Elements of Gamification Application	Riyadh	223	4.34	.688	-.077-	387	.939
	Elementary Classes	166	4.35	.808			
Overall Score	Riyadh	223	4.47	.573	-.533-	387	.595
	Elementary Classes	166	4.50	.716			

According to Table (5), there were no statistically significant differences at the level of significance (0.05) for the degree of application of the gamification strategy from the perspective of the study sample based on the variable of the school stage on the total degree and on all axes. The researcher attributes this to the awareness of the teachers and their keenness to use the gamification strategy at all stages because of the pace of technology, especially after they possess technical skills during the distance education period due to the Corona pandemic. Also, it is a method that is in line with the characteristics of learners in the current era as they are attracted to non-traditional methods, especially those that contain courses and challenges in order to collect the highest scores. The gamification strategy also provides information to learners in a way that allows them to retain information faster, especially if dealing with a game that involves listening to animal sounds.

This result agrees with Al-Abdan and Al-Qarni (2021), indicating the keenness of teachers in the field to keep pace with techniques and use the gamification strategy because of its stimuli that achieve learners pleasure in learning.

As for the differences in the second axis which is determining the learning goals, which was in favor of the primary grades. The researcher attributes this to the fact that the child of this stage is characterized by a number of characteristics such as motor activity, and keenness to master what is already gained from experiences and skills. Another reason is the nature of the content and the educational

environment that imposes on the teacher the formulation of goals that take into account the capabilities of children. It provides them with the opportunity to verify the progress of learners and build their knowledge clearly and simply based on higher thinking skills and modern technologies.

Second: Training Variable

The researcher used the test (T) to show the significance of the differences between the arithmetic mean of the degree of application of the gamification strategy from the perspective of the study sample on the bases of training as in Table (6):

Table (6): Test (T) to show the significance of the differences between the arithmetic mean of the degree of application of the gamification strategy from the perspective of the study sample on the bases of training

Axis	Stage	Number	Arithmetic averages	Standard deviations	T	Degrees of freedom	Significance
First Theme: Understanding the Target Audience and Context	Receive training	123	4.69	.623	5.136	387	.000
	Not receiving training	266	4.33	.655			
Second Theme: Setting Learning Objectives	Receive training	123	4.72	.652	3.489	387	.001
	Not receiving training	266	4.46	.675			
Third Theme: Organizing Educational Experience and Content	Receive training	123	4.75	.644	3.550	387	.000
	Not receiving training	266	4.50	.644			
Fourth Theme: Identifying Resources	Receive training	123	4.71	.636	2.977	387	.003
	Not receiving training	266	4.49	.692			
Fifth Theme: Elements of Gamification Application	Receive training	123	4.52	.772	3.284	387	.001
	Not receiving training	266	4.26	.712			
Overall Score	Receive training	123	4.66	.643	3.910	387	.000
	Not receiving training	266	4.40	.617			

According to Table (6), there are statistically significant differences at the level of significance (0.05) to the degree of application of the

gamification strategy from the point of view of early childhood teachers in Al-Ahsa city according to training on the total degree and on all axes and in favor of teachers who received training and the researcher attributes this to the attendance of teachers for training courses increases their possession of technical skills that allow them to diversify the experiences that are provided to learners, whether through watching, listening, Or the practitioner, in addition to being able to provide educational content in a way that enables learners to remember the educational material for as long as possible. This result contradicts Al-Abdan and Al-Qarni (2021)indicating no differences for the training courses variable, and it is consistent with the result of Al-Otaibi (2021), meaning differences due to the training courses variable and in favor of the teachers who obtained the training courses related to modern strategies, especially the gamification strategy.

Third: Experience Variable

The single variance was analyzed to show the significance of the differences between the arithmetic mean of the degree of application of the gamification strategy from the perspective of the study sample according to the experience variable as in Table (7):

Table (7): Analysis of single variance to show the significance of the differences between the arithmetic averages of the degree of application of the gamification strategy from the perspective of the study sample according to the experience variable

Axis	source	Sum of Squares	Degrees of freedom	Mean of squares	P	Significance
First Theme: Understanding the Target Audience and Context	Between groups	2.940	2	1.470	3.352	.036
	Inside groups	169.291	386	.439		
	Total	172.231	388			
Second Theme: Setting Learning Objectives	Between groups	.095	2	.047	.103	.902
	Inside groups	178.114	386	.461		
	Total	178.208	388			
Third Theme: Organizing Educational Experience and Content	Between groups	1.493	2	.747	1.755	.174
	Inside groups	164.173	386	.425		
	Total	165.666	388			
Fourth Theme: Identifying Resources	Between groups	2.990	2	1.495	3.258	.040
	Inside groups	177.122	386	.459		
	Total	180.112	388			
Fifth Theme: Elements of	Between groups	4.650	2	2.325	4.311	.014
	Inside groups	208.199	386	.539		

Gamification Application	Total	212.849	388			
Overall Score	Between groups	1.750	2	.875	2.169	.116
	Inside groups	155.720	386	.403		
	Total	157.470	388			

Based on table (7) statistically significant differences at the level of significance (0.05) exist for the degree of application of the gamification strategy from the point of view of the study sample according to the experience variable on each of the first axis: understanding the target audience and context. The same is in the fourth axis, identifying resources, and the fifth axis, elements of gamification application, while no differences appeared on the total degree and on both the second and third axis, and to show statistically significant differences, LSD comparisons were used. and Table 8 shows this:

Table (8) LSD dimensional comparisons of statistically significant differences

Axis	experience (I)	experience (J)	Average difference	Itself.
First Theme: Understanding the Target Audience and Context	from 5 to 10	Less than 5years	.166*	.022
Fourth Theme: Identifying Resources	Less than 5years	More than 10	.278*	.011
Fifth Theme: Elements of Gamification Application	Less than 5years	More than 10	.316*	.008
	from 5 to 10	More than 10	.341*	.005

Table (8) showed statistically significant differences at the level of significance (0.05) on both the first axis, understanding the target audience and the context between those with (5-10) years of experience and those with less than (5) years and in favor of the former, Also, the researcher thinks that the similarity of the conditions of the teachers, as they have positive experience in planning classroom teaching and learning that enables them to reach beyond the classroom with different tasks assigned to them.

The fourth axis, identifying resources, shows differences between those with experience less than (5) years with those with more than 10 years of experience and in favor of those with less experience. Those with less teaching experience are new to the courses they studied during their academic stages and acquired a variety of skills

and are keen to follow developments and keep pace with the times. This finding agrees with Al-Abdan and Al-Qarni (2021).

The results of the second question: What are the obstacles to applying the gamification strategy and the point of view of early childhood teachers in what is the Al-Ahsa?

In the interest of the researcher to verify the results and identify the obstacles to the application of the gamification strategy, the interview was carried out with (8) teachers to answer the second study question. Based on the answers of the teachers, it was found that there are a number of obstacles and for ease of review, the researcher classified them into two groups (Administrative and teacher-related obstacles). These obstacles are presented below:

Teacher No. (3) stated that the increase in administrative tasks and teaching burdens constitutes an obstacle to the use of this strategy and other modern methods that require prior preparation, especially since the task that is assigned to her takes place during the official working hours.

Teacher No. (5) confirmed that assigning her extracurricular activities that have nothing to do with the curriculum increases the tasks entrusted to her, which prevents her from keeping pace with development and using modern strategies such as gamification strategy. Teacher No. (8) with this result, stressing that the large number of burdens and tasks that are assigned to them prevents them from following up on everything new, while teacher No. (1) and No. (2) have stated that the weakness of the Internet and its lack sometimes within the school hinder the use of the gamification strategy and other modern strategies. Also, the rest of the teachers confirmed the existence of this obstacle. The teacher No. (6) added that the school's lack of modern devices and the large number of female students in the classroom are obstacles to the use of this strategy. This concurs with Al-Abdan and Al-Qarni (2021)confirming that the administrative obstacles came to a high degree.

It is clear from the above that the administrative obstacles were first with high score. The researcher attributes this to the lack of an appropriate educational environment to implement the gamification strategy.

The obstacles related to the teacher came in second place, as teacher No. (2) stated that the application of the gamification strategy and other modern strategies is a waste of time at a time when the teacher does not have time to prepare for such a strategy. Teachers No (1) and No. (5) added that their lack of access to training courses related to the gamification strategy is an obstacle from their point of view. Teacher No. (8) also confirmed that the training courses lack the practical and applied part that proves the teachers enrolled in them the opportunity

to practice this strategy, while teacher No. (4) indicated that she is bored and does not want to develop herself and keep pace with modern changes. Also, teacher No. (3) and teacher No. (6) have confirmed that the information acquired from the courses could be forgotten due to the lack of time, opportunity and devices that allow them to prepare and apply the gamification strategy.

Accordingly, it is clear that teachers need practical training courses that enable them to apply this strategy, which contributes to increasing the motivation of the learner. This result contradicts Al-Otaibi (2021)who confirmed that the lack of receiving teachers for training courses related to the subject of the gamification strategy is one of the obstacles that prevent the use of this strategy.

Recommendations and future works

Based on the above, the researcher recommends the following:

- Holding practical training courses for teachers in the field of modern teaching strategies in general and gamification strategy in particular.

- Providing the educational environment and infrastructure in schools with technologies and means that enable teachers to keep pace with technical development and apply modern strategies such as gamification.

- Conducting studies to identify he degree of application of the gamification strategy in male and female schools to compare them.

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Bibliography

Al-Abdan, M. M., & Al-Qarni, B. S. (2021). The degree of application of the gamification strategy in science education and the obstacles to its application from the point of view of female teachers in the city of Makkah (Vol. 138).

Al-Far, I. A. W. (2004). Computer Education and the Challenges of the Beginning of the Twenty-first Century. Cairo: Dar Al-Fakr Al-Arabi.

Al-Gazzar, A., Awad, A., & Wahab, A. A. (2022). Developing an e-learning environment based on the gamification strategy to develop mathematics skills for kindergarten children. Journal of the Faculty of Education, 73(3).

Al-Ghamdi, W. A. (2018). TeachingBMathematics Teachers Program for the Use of Gamification in Teaching the Primary Stage. (Master Unpublished). mam Muhammad bin Saud Islamic University,

Al-Malah, T. (2016). Educational stimuli Gamification: A qualitative leap in the psychology of students, new learning. Retrieved from https://www.new-educ.com

Al-Mulla, A. F. H. (2007). Obstacles facing educational scientific research and preventing the benefit of its results in the development of education and training Journal of the Association of Arab Universities.

Al-Mutairi, S. (2021). A Proposed Model for Designing a Gamification-Based E-Learning Environment in the Light of Gamification Design Standards. nternational Journal of E-Learning, 3(1).

Al-Nadi, H. (2020). The Effect of Using Gamification on Developing Creative Thinking Skills among Third Grade Students in Science in the Capital Amman (Master's Unpublished). Middle East University, Jordan.

Al-Otaibi, S. O. (2021). The degree of application of the gamification strategy and the obstacles to its application for computer teachers in the Riyadh region, Kingdom of Saudi Arabia. Scientific Journal of the Faculty of Education, 37(IV).

Al-Qaed, M. (2015). What is gamification? What do we mean by gamification in the educational process? New education, retrieved on 13 Rabi II 1444 Retrieved from https://www.new-educ.com/gamification-education

Al-Salami, S. S. (2019). (PhD unpublished). Umm Al Qura University,

Alomari, I., Al-Samarraie, H., & Yousef, R. (2019). The role of gamification techniques in promoting student learning: A review and synthesis. Journal of Information Technology Education: Research, 18(08), 2019.

Aşıksoy, G. (2018). The effects of the gamified flipped classroom environment (GFCE) on students' motivation, learning achievements and perception in a physics course. Quality & Quantity, 52, 129-145.

Asmaa, A.-M. (2022). Gamification in Education Retrieved from https://www.neweduc.com/%D8%A7%D9%84%D8%AA%D9%84%D8%B9%D9%8A%D8%A8-%D9%81%D9%8A-%D8%A7%D9%84%D8%AA%D8%B9%D9%84%D9%8A%D9%85

Brophy, K. P. (2015). Gamification and mobile teaching and learning.

D, G. (2014). (2014). Gamification in e-learning.

. United Kingdom: Ashridge Business School.

De Byl, P. (2013). Factors at play in tertiary curriculum gamification. International Journal of Game-Based Learning (IJGBL), 3(2), 1-21.

Hamid, M. A.-M. (2017). Education in the Information Age. Al Ain: UAE: University Book House.

Huang, W. H.-Y., & Soman, D. (2013). Gamification of education. Report Series: Behavioural Economics in Action, 29(4), 37.

Jenkins, J. (2016). Top 4 Gamificiatin Problems to Aoid. Retrieved from https://elearningndustry.com/elearning-authors/jayme-jenkins

Marín-Díaz, V., Sampedro-Requena, B. E., Muñoz-Gonzalez, J. M., & Jiménez-Fanjul, N. N. (2020). The possibilities of gamifying the mathematical curriculum in the early childhood education stage. Mathematics, 8(12), 2215.

Shaheen, Y. (2020). The effectiveness of the gamification strategy in managing the learning environment and improving academic performance among students of the basic education stage. Journal of the College of Education for Girls(110).