Gamification and Learning in Education: Theories, Models, and Applications

A New Digital Strategy of Learning and Acquisition

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Abstract

This paper explores gamification-based learning by presenting prominent theories, applied models, and supportive applications that facilitate learning and knowledge acquisition. It aims to illustrate the educational and cognitive impacts of gamification, such as enhancing motivation, driving engagement, and capturing learners' attention. This is achieved by presenting and analyzing literature related to gamification-based learning, including concepts, theories, and practical models.

To address the research questions, we utilized the five-step learning model based on the gamification strategy by Soman and Huang (2013). This model asserts that the success of gamified learning depends on understanding the characteristics of the sample and target groups, comprehending the context in which the educational program is applied, and defining clear, observable, and measurable objectives. Additionally, it emphasizes the organization of a learning experience that captures the interests and attention of learners.

Keywords:

Gamification, learning, theories, models, Kahoot application

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Introduction

Digital learning is among the modern mechanisms that support and enhance the educational learning process, transforming it from traditional rote learning to interaction and stimulating cognitive abilities, making it highly effective and prominently participatory. This is achieved by utilizing a range of modern digital means, among which is gamification, a recent application in the field of educational technology and learning.

Historically, gamification is a new term in the educational field. Its origins trace back to the digital media industry, and the term gained popularity in 2008 through Gabe Zichermann, who is considered the first to employ the term in his definitions (Ramos & Melo, 2019). However, it did not become widely and intensively popular until the second half of 2010. To go further back, its origins can be found in the British consulting company Conundra Ltd., founded in 2003 by Nick Pelling, a digital game designer and gamification specialist.

Gamification is thus one of the pedagogies, or rather digital strategies, that leverage traditional game elements in contexts unrelated to play and entertainment in the field of education and learning. It can be seen as an educational approach aimed at motivating learners and breaking the monotony of traditional learning typically practiced in classrooms. The goal is to maximize the stimulation of learners' cognitive abilities, such as memory, perception, and attention, and to ensure better participation within the classroom without deviating from the educational objectives the teacher aims to achieve. According to Jane McGonigal, gamification goes beyond its application in education; it is a tool capable of changing the world, describing a new reality and era that enables players to collectively engage in this strategy, address social and political issues, and even overcome them. In this sense, gamification is a pivotal tool for ambitious change (Krath et al., 2021).

Technically, the concept of gamification is associated with rewards or incentives, meaning that gamification platforms and applications rely on progressing through levels and earning points to continue improving. Hence, it becomes clear that gamification is inherently different from ordinary play since it intersects with pedagogy in some of its fundamental components, such as construction, application, achievement, and evaluation, among others.

In terms of semantics, the concept of gamification corresponds to several terms, including gamification and playfulness. However, after reviewing the literature and previous studies on the subject, we found that the most commonly used and indicative term is "gamification," which justifies our use of the term "gamification" instead of other translations in the rest of this research. So, how has gamification been defined by researchers in the educational field, and what are its operational implications within the research text?

Definitions of gamifications in education

From the aforementioned discussion, we observe that after the official use of the concept of gamification by Gabe Zichermann in 2008, it has become one of the most widespread and popular concepts worldwide. This is not only in the field of education but also among organizations and companies due to its diverse applications and benefits. This interest has extended to the Arab world, so it was necessary to accurately and carefully examine the concept of gamification within the context of this research.

Alexandre Duarte and Sébastien Bru defined gamification as a design method that applies game mechanisms to other processes to achieve specific goals. It is a new discipline that combines four approaches: the first approach focuses on user-centered (learner) methodologies, the second on the universal principles used in play, the third on marketing to build an effective strategic vision, and the fourth on social cognitive sciences, including neuroscience, social psychology, and other sciences. The goal, according to the researchers, is to generate commitment and participation in all vital sectors that always need motivation. Gamification is a comprehensive way to identify a problem and design practical solutions with continuous improvement, based on the previously mentioned disciplines and integrating them thoughtfully (Pereira et al., 2014).

Kapp considers gamification to be the use of game-based mechanics, aesthetics, and thinking processes to engage and motivate learners, encouraging them to learn through play and problem-solving (Kapp et al., 2020). Nicholson views gamification as the application of video game elements like points, levels, and achievements in other areas such as work, education, and learning. He also believes that gamification in learning and acquisition leverages game elements to attract and motivate learners.

In this sense, gamification is the optimal use of games across various fields, relying on mobile applications and similar devices. Its primary goal is to help users and learners achieve their objectives and acquire new and useful skills to be more productive. Gamification fosters an engaged and active user and learner towards the application of gamification in general and its content specifically by designing a particular game for this purpose (Tóth & Tóvölgyi, 2016).

Similarly, Fisher, Beedle, and Rouse define gamification as the use of game mechanics in non-game applications and contexts to integrate learners into the process of learning, acquisition, and problem-solving training (Ma & Oikonomou, 2017). Zichermann and Cunningham consider gamification to be a learning method that changes thinking methods and uses game rules to increase learners' interest in educational content and develop their problem-solving skills.

In our commentary on the forms and contents of gamification as presented by a group of researchers and founders, we highlight four main pillars as follows:

1. After careful review and consideration of the previous definitions, it is clear that they intersect and resemble each other in many of the contents and ideas that shape the perspectives of Zichermann, Kapp, Alexandre Duarte, and Sébastien Bru.
2. From a thorough examination of the definitions mentioned above, we conclude that they can be divided into two main approaches. The first is a pragmatic, realistic approach that views gamification as a tool to achieve educational objectives and improve learner performance, as seen by Kapp, Fisher, Beedle, and Rouse. The second is an idealistic approach that relies on gamification to ensure learner satisfaction, commitment, and participation in the educational process, as evidenced in the definitions by Nicholson, Zichermann, and Cunningham.

After presenting and analyzing the most prominent definitions of the concept of gamification, the researcher concludes that gamification can be defined as the use of digital games for purposes other than their usual goals of entertainment and amusement. Its aim is to support and enhance learners' abilities and skills, ensure their participation and commitment, and maintain their attention for longer periods.

Research Questions

Q1: Do gamification strategies possess scientific learning components, or are they merely games?

Q2: What are the key explanations, theories, and learning models that address gamification strategies?

Q3: What steps should be followed to develop educational content based on gamification?

The Importance of Gamification

Traci Sitzmann's study indicated that game-based learning (GBL) has become an effective and efficient learning method. This type of learning is superior to traditional learning methods and mechanisms. It increases learners' self-confidence by approximately 20%, enhances knowledge based on understanding by 11%, helps retain and recall learned information by up to 90%, and boosts practical knowledge by about 20% (Kapp et al., 2020).

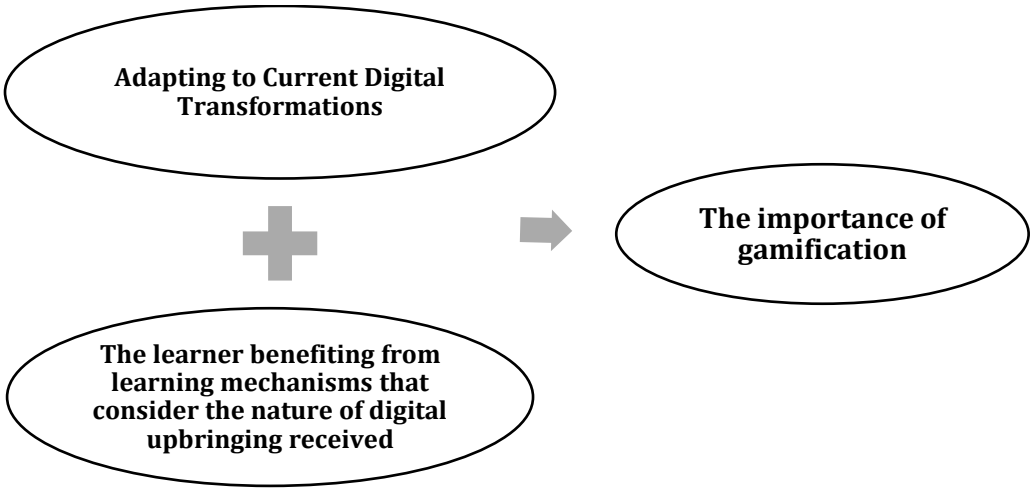
Gamified accompaniment fits within the context of positive interaction and digital adaptation to the global transformation occurring across various fields, especially in education and training. This shift has been expedited by events like the COVID-19 pandemic, during which digital learning became the primary mode of education for both acquisition and assessment. Consequently, it is crucial to stay vigilant with the rapid advancements in software and computer sciences; otherwise, we risk losing our connection with the younger, digital-native generation. This adaptation can enhance and develop skills by utilizing technological tools, including the gamification strategy.

The importance of gamified accompaniment lies in its ability to help educators understand learners' behaviors and dispositions. Play generally reveals the inner workings of individuals, transitioning from a mere entertainment mechanism to one of accompaniment, monitoring, tracking, and support in various forms. This approach allows for diagnosing the current situation and anticipating future developments.

The significance of gamified accompaniment in education primarily revolves around developing and enhancing learners' critical thinking and acknowledging their extensive access to information, given that today's learners, or the new digital generation, can access information with just a click. This highlights the importance of monitoring and reinforcing learners' behaviors through gamification to guide and refine their use of digital tools. In this context, gamification becomes an effective monitoring mechanism rooted in enjoyment, challenge, and excitement rather than punishment and discipline, which is especially pertinent during childhood and adolescence, requiring special treatment from educators.

Furthermore, gamified accompaniment caters to the nature and specificity of the new digital generation, equipping learners with skills, abilities, and competencies through gamification as a modern digital tool. It respects the principle of digital upbringing inherent In this generation. The didactic and pedagogical tools used in learning during the 1990s, for instance, differ significantly from those employed today. Therefore, the gamification strategy stands out as a digital mechanism that considers the uniqueness of this generation, where actions in the digital world parallel those in the real world. To summarize all of this, we can express the importance of gamified accompaniment in the following figure:

Fig 1. The importance of gamification



Goals of gamification

It has been shown through the preceding discussion that gamification strategies have various effects on learner behaviors, including motivation, engagement, attention, and others. Therefore, it is essential to delve into the three main goals of gamification: cognitive, affective, and social, as follows:

Cognitive goals

The cognitive goals of the gamification strategy become evident when learners are enticed to reach the next level as a reward. This goal is achieved after a long journey of guiding them through experimentation, discovery, and attempts, where gamification applications typically rely on progressively increasing the difficulty level (Beza, 2011). To advance, learners must engage with the game and explore the physical elements it is built upon.

Gamification applications often employ a gradual increase in the difficulty of the presented content, as previously mentioned, which positively impacts learners by reducing boredom and capturing their attention. Moreover, these applications provide learners with a variety of solutions, allowing them to develop their own playing strategies.

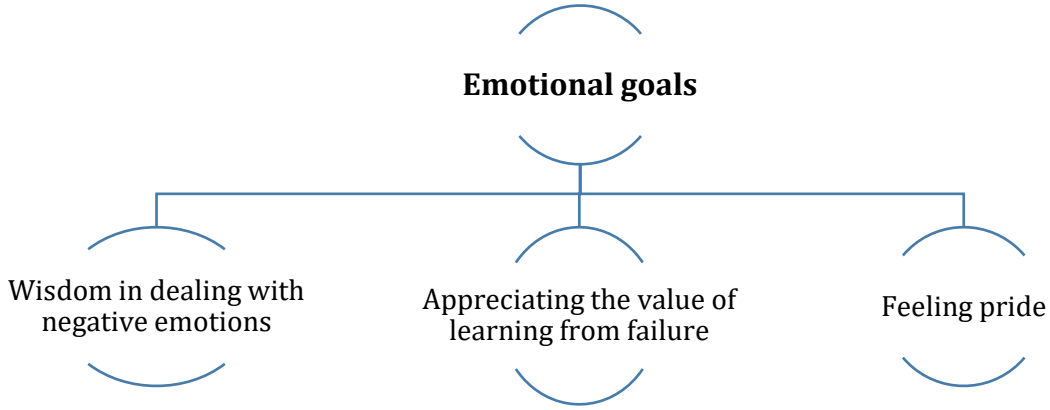
The cognitive objectives of gamification strategies are clearly demonstrated when learners understand what they need to do, unlike traditional learning methods where tasks are often assigned without the learner comprehending the benefits. Additionally, learning through gamification values individuality by allowing each learner to choose their own approach to solving the presented problem, thereby acquiring new problem-solving skills with confidence.

Emotional goals

Gamification strategies can evoke a range of emotions within learners, such as curiosity, frustration, and joy. Positive gamification experiences can instill optimism in learners and make them feel proud when they successfully achieve learning goals. Even in cases of failure, gamification can be beneficial as learners persistently try again until they learn something new with each attempt.

The experience of repeatedly attempting to solve a problem is not a waste of time; on the contrary, it is an effective way to help learners avoid past mistakes and overcome initial anxieties associated with failure. In real life, every effort a learner makes is rewarded, and failure is seen as another opportunity to try again rather than succumb to disappointment (Nah et al., 2014). In summary, all of this can be encapsulated as follows:

Fig 2. Calligraphy illustrates the components of emotional goals related to gamification.



Social goals

It is worth mentioning that learning through manipulation strategies helps learners develop and enhance what is known as school identity. This occurs through learners' interaction with each other, sharing achievements and goals, which contributes to forming school identity among them. Consequently, learners perceive school from a different perspective than the traditional identity they were accustomed to previously. In this sense, the manipulation strategy encourages learners to collectively think about problem-solving with their peers, not only in solving educational puzzles but also in dealing with social issues. This approach goes beyond these aspects, potentially becoming a method for initiating change as well (Oliveira & Bittencourt, 2019).

Gamification theories

There are several theories that have addressed play in terms of its purposes, functions, components, and how it is applied. We can discuss the most prominent ones as follows:

Theory of Gamified Instructional Design

This theory is among the prominent theories that address the psychological dimensions underlying the strategy of gamification in the field of education and training. It describes two main psychological processes through which game elements can be employed to achieve learning objectives in a playful framework. The first process involves designing the gamification process to influence a specific situation or to aim at changing and modifying certain behaviors, while the other process revolves around the necessity of gamification to achieve a range of cognitive goals, the most prominent of which is the development of the learner's metacognitive thinking (Reiners & Wood, 2015).

The proponents of this approach emphasize the necessity of evaluating the success of the gamification process in meeting the expectations of the educational interveners. In cases where there is dissatisfaction with the outcome of the gamification process, the teacher is compelled to

make either partial or complete adjustments to the gamified game design. Additionally, instructional design theory specifies the aspects that should be utilized and adapted for the success of the gamification strategy (Gonz & Revuelta-dom, 2022). Bedwell identified the vital elements upon which a gamification strategy must be based, including the language of gamification application, assessment, challenge, and imagination integration in the game, as well as the definition of rules and objectives (B. Huang et al., 2021).

The significance of this approach specifically lies in being the only approach that addresses gamification in its own right. In other words, it interprets gamification in relation to its constituent elements, objectives, and mechanisms of implementation, rather than through learning theories or educational technology.

Self-determination theory (SDT)

It is worth mentioning that understanding this theory in relation to gamification strategy only comes after a scientific inventory of its components, foundations, and bases. This theory has significantly influenced the field of psychology through its interpretations of internal and external stimuli that affect individuals' perceptions and behaviors. Moreover, it draws its epistemological foundations from the Cognitive Evaluation Theory (CET), which acknowledges that motivation has two distinct advantages. The first revolves around granting the other the ability to assess the learner's competencies and skills according to motivational logic. The second advantage enables the learner to identify and perceive the causes that drove them to accomplish a specific task. This is known, according to the CET (Ryan & Deci, 2000), as controlling perceptions.

This control, according to the Cognitive Evaluation Theory (CET), leads to interaction with the environment when the learner realizes that their educational behavior is appreciated by the teacher or educational actor. This feeling then transitions from individual perception to behavior and attitude. Perhaps the most prominent example of this is evident in a student whose drawings are consistently praised by friends and classmates, leading them to decide to specialize in fine arts within college (Kam & Umar, 2018). One might wonder about the relationship between CET and gamification strategies. In other words, how can we benefit from and implement CET in the context of gamification strategies?

The theory of self-determination (SDT) can be leveraged in designing and implementing gamification goals, primarily to build a gamification strategy that stimulates both internal and external motivation for learners, whether for educational purposes or even behavior change. Delving deeper into this matter, it's worthwhile to present and interpret the arguments of Ryan, Rigby, and Przybylski, who argue that formulating educational content based on gamification strategy fosters learners' sense of autonomy and enhances their cognitive abilities to complete the remaining learning process (Przybylski et al., 2012). It's crucial to emphasize the integration of social media tools in executing learning goals through gamification strategies so that learners can

perceive the difference between learning through gamification as a modern pedagogical mechanism that utilizes digital tools to motivate and encourage them in their learning journey.

Overall, developing and stimulating intrinsic motivation is a highly complex and costly process in terms of preparation and implementation. Therefore, teachers must rely on motivation theories, and perhaps the most effective choice is Self-Determination Theory (SDT) by Deci and Ryan (Lamprinou & Paraskeva, 2015). SDT emphasizes the importance of addressing learners' internal needs before preparing any pedagogical plan, which contradicts the principles of behaviorist theory, which exaggerates the impact of external stimuli.

Expectancy Theory

First and foremost, before delving into discussing and analyzing the relationship between the manipulation strategy and the expectations theory, it was necessary to initially clarify the origins, foundations, and bases of the latter. Victor Vroom is considered the actual founder of this theory, which is based on three components symbolized by VIE (Valence, instrumentality, and expectancy). The first component refers to an individual's orientation towards achieving a specific goal, which Victor Vroom refers to as the personal goals-rewards relationship. This can be positive, meaning the individual prefers to achieve a result, or it can be neutral, indicating the individual is indifferent to reaching a result. Additionally, it can be negative (Allen S. et al., 2015), suggesting the individual prefers not to achieve any goal. Furthermore, Victor Vroom emphasizes that these rewards can be external, such as salaries and financial incentives, or they can be internal (intrinsic), such as feelings of accomplishment or self-esteem enhancement.

As for the second component of the three components of VIE, which is instrumentality, the idea here is simple yet highly effective in enabling us to understand and evaluate individual outcomes. Instrumentality in this context refers to the probabilistic belief that one outcome (such as performance level or learning) is linked to other outcomes related to the previous component (valence), known as the performance-outcome relationship (Singh, 2020). This is accomplished by assigning values to performance. For example, a value of 1 indicates that performance will definitely lead to positive outcomes, unlike a value of -1, which suggests a high probability of achieving negative outcomes, and so on.

The third and final component is expectancy, referring to the strength of belief and confidence that one's efforts will lead to desired outcomes (performance level and learning). This element is denoted by the effort-performance relationship. Typically, the assessment rate ranges from 0, indicating no likelihood that effort will lead to performance, to a value of 1, indicating complete certainty that effort will lead to performance (Krath et al., 2021).It is crucial to accurately distinguish between expectations and instruments. Expectations refer to the relationship between effort and outcome, while instruments indicate the nature of the relationship between outcome and outcome.

Building upon the previous discussion, Victor Vroom argues that an individual's level of motivation for learning should be measured according to the following formula: motivation = V × I × E. Put simply, we can express this as the individual being motivated to perform a certain behavior when they clearly perceive that their effort will lead to successful performance, which in turn will ultimately result in an outcome (Lanuza et al., 2021). This outcome is then assigned high value by the individual. Now, how does all of this relate to gamification strategy, and how can we leverage it based on gamification?

According to Vassileva, there are three main links between expectancy theory and learning based on gamification. The first link revolves around the potential use of expectancy theory to understand and analyze why rewards such as collecting points, earning badges, or leveling up in gamified learning environments motivate learners. This simply boils down to the process of self-assessment by the learner. If the learner perceives that they have earned numerous points and badges, they feel that their effort has led to performance, and that performance has resulted in an assessable and measurable outcome (Vassileva, 2012). Consequently, they become motivated to engage in learning through gamification to enhance their knowledge, abilities, and achievements.

As for the second link between expectancy theory and gamification, it is expressed by Hsu, Chang, and Lee, who argue that the relationship between learning through gamification and rewards is clear even before the start of the pedagogical learning program. When learning through traditional teaching methods, learners may undergo assessment exams without prior knowledge of the evaluation criteria used by the instructor to assess their answers. In contrast, learning through gamification applications enables learners to immediately know the badges and points earned after answering. Consequently, learners feel that their performance allows them to evaluate their results (Hsu et al., 2013).

The final convergence point between gamification and expectancy theory lies in the emotional aspects of learner motivation, represented by two elements: status and reputation. The first element, status, is acquired in isolation, meaning individually, by the learner, unlike reputation, which relies on the opinions of others (Yusuff et al., 2019). These two elements may instill a sense of pride within the learner as an emotional response to achieving certain significant goals. This, in turn, leads the learner to feel pride and to continue engaging and learning more effectively.

In conclusion, after presenting and analyzing modern theories that address gamification in terms of its nature, functions, and objectives, both in learning contexts and in terms of behavior understanding and modification, we arrive at several conclusions. One of the most prominent is the ability of this strategy to enhance various cognitive and metacognitive competencies (Khadraoui & Barebzi, 2023). Additionally, it enables us to assess learners' progress with a precise and effective approach. Moreover, it instills motivation for learning within learners through a gamified framework, surpassing what is known as “didactic withdrawal” (Schnapp et al., 2018).

Furthermore, we can integrate an element of interactivity with prominent educational theories and learning.

In conclusion, after presenting and analyzing the modern theories that address the gamification strategy in terms of its nature, functions, and goals, whether in relation to learning or understanding and modifying behavior, we reach several conclusions. The most prominent among these is the ability of this strategy to enhance various cognitive and metacognitive competencies. Additionally, it allows for the precise and effective assessment of learners' achievements. This is not to mention its role in boosting learner motivation through a gamified approach and overcoming what is known today as didactic withdrawal. We can also align it with major theories of education and learning. However, despite all this, it has not addressed the relationship between the gamification strategy and cognitive processes such as memory, perception, and attention. This highlights the significance of this research in completing and paying attention to what has not been addressed by studying the impact of the gamification strategy on the attention process in learners. This can give a practical aspect to the aforementioned theories and how to benefit from them by examining the following model:

Models and applications of gamified learning

The Five-Step Model in Gamified Learning by Huang and Soman

Many theories have addressed the gamification strategy in terms of components and goals. However, few offer a model and practical steps for building the educational process based on the gamification strategy. In this context, Huang and Soman (2013) presented a model called the Five-Step Model for Gamified Learning. This model emphasizes the importance of understanding the characteristics of the sample and the target group, as well as the necessity of comprehending the context in which the gamified educational program is applied. It also stresses the importance of clearly defining goals that are observable and measurable and organizing a learning experience that captures the interests and attention of learners (W. H. Huang & Soman, 2013). We can express the five steps in the following table:

Step	Meaning
1	Understanding the Target Audience and the Context Surrounding the Gamification Program
2	Defining Educational Objectives through the Use of the Gamification Strategy
3	Dividing the Gamification Program into Stages
4	Identifying the Necessary Resources for a Successful Gamified Learning Experience
5	Implementing gamification elements

Table 1. The five-step model in gamified learning by Huang and Soman

Therefore, based on the table above, we can elaborate on each step of the program in detail. The first step primarily revolves around understanding the research sample and the surrounding context of the manipulation program. This involves identifying the characteristics and needs of the sample, in addition to understanding the context surrounding the learning process, such as the environment, available educational tools, and necessities.

The second step focuses on defining the educational objectives and suitable content. This stage necessitates identifying the most appropriate educational content that will help in defining the desired goals. Meanwhile, the third stage involves dividing the educational program based on the manipulation strategy into measurable and evaluative stages and steps. This will assist the researcher in identifying and diagnosing the difficulties that learners may face, whether technical or cognitive, to improve and enhance the learning experience using the manipulation strategy.

Similarly, the primary goal is defined in the fourth stage's importance of ensuring that elements of manipulation, such as challenges, prizes, signs, and positive interactions with the educational program, are integrated. The goal is to make the educational process more enjoyable and stimulating.

As for the final step, which involves applying and courageously experimenting with the learning experience using the manipulation strategy, Huang and Soman believe it aims to achieve two main goals. The first primary goal concerns achieving the goals that have been pre-established, while the secondary goal focuses on improving the learning experience in a general manner.

So, how can we then build an educational program that relies on this model? In other words, what are the mechanisms, or rather, the auxiliary applications, that help achieve this goal?

Using Kahoot as an application for gamified learning strategies

The origin and founding

In 2006, within the framework of a research project called "Lecture Test" at the Norwegian University of Science and Technology, the research project was completed and the digital game-based learning platform called Kahoot was launched. Kahoot company was officially founded in 2013, aiming to design an easy-to-use educational platform for teachers, helping them deliver educational content, conduct tests, and evaluate learners' responses about the learning process (Wang & Tahir, 2020).

Furthermore, as previously mentioned, researchers recommend that this new form of learning enhances learners' motivation towards the learning process, which was the driving force behind establishing and launching a startup company to develop a digital platform for game-based learning, linked to the results of this experiment (Neureiter et al., 2020).

There is tangible evidence that the use of digital mechanisms enhances the learning and comprehension process, as there has been a clear improvement in learners' responses and

reactions after teachers adopted computers, smartphones, and electronic boards in presentation and lecturing pedagogy. Moreover, these technologies contribute to enhancing learning motivation and provide teachers with another opportunity to diversify assessment and evaluation methods (Tan et al., 2018). Kahoot is among the digital applications that have proven their effectiveness in the fields of learning and education. What are its implications? What are its components? How is it employed and relied upon?

Definitions of Kahoot in education

Wang and Tahir view Kahoot as an educational response system built on digital gaming, aimed primarily at transforming classroom learning environments to be more enjoyable and engaging. Simultaneously, it maintains the integration of teacher-approved content and oversight by educational authorities, while supporting various types of digital devices such as smartphones, computers, and electronic boards (Marsa et al., 2021).

Wang and Tahir further explain that Kahoot seeks to achieve three core objectives: enhancing learners' participation and motivation during learning, improving their retention and comprehension abilities, and achieving these goals through features such as animated gameplay, diverse sounds, and vibrant colors. Additionally, Kahoot's versatility allows its use across multiple educational levels, from primary education to university settings.

In line with this, Gündüz and Akkoyunlu affirm that learning through Kahoot offers several advantages, including equipping teachers with tools to create educational lessons that blend fun with the curriculum as well as the ease of creating multiple-choice quizzes. Moreover, its accessibility and usability across various digital devices via web browsers highlight another critical feature: providing teachers with analyzable results to understand and evaluate learners' performance and levels of understanding (Gündüz & Akkoyunlu, 2020).

Summarizing the collective insights, researchers converge on the multifaceted and complementary nature of Kahoot's functionalities in defining its roles and functions. They also agree on its effectiveness in the field of learning and education, particularly in enhancing motivation, fostering engagement, and capturing learners' attention.

The components of the Kahoot application

Technology today affects many educational aspects, particularly in assessment and evaluation, and plays a crucial role in overcoming some of the side issues that hinder the success of the educational learning process, including students' feelings of boredom during exams and assessments.

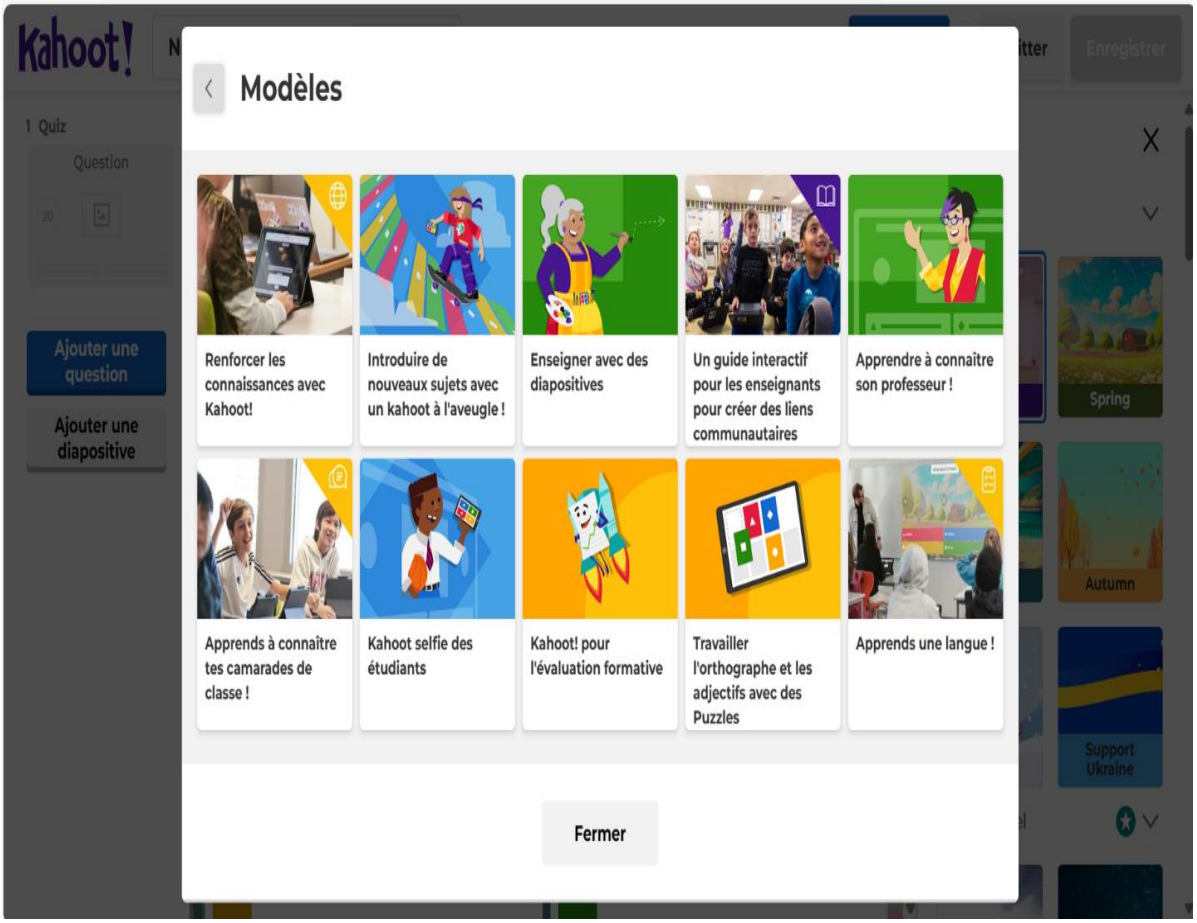
Building on previous findings, a study by Sri Wahyuni and Fauzul Etfita in 2023 highlighted the importance of using the Kahoot application as an alternative pedagogical tool for assessment and evaluation. The study aimed to investigate students' reactions to their assessment of English

language grammar proficiency using Kahoot, with the participation of seventy-five students. The researchers employed a qualitative descriptive approach, using both questionnaires and interviews as tools for data collection and analysis. The study concluded with the central finding that most respondents expressed positive reactions to using Kahoot as a means of evaluation compared to traditional paper-based exams. This is primarily because Kahoot provides an interactive space with sound and music, encourages learners to focus, and motivates them to explore further (Wahyuni & Etfita, 2023).

In light of this context, a pertinent question arises: What are the components of the Kahoot application that constitute a unique learning and evaluation experience for students? To answer this previously raised question, we present the components of Kahoot succinctly and in accordance with the following:

- ***Interface of Kahoot***

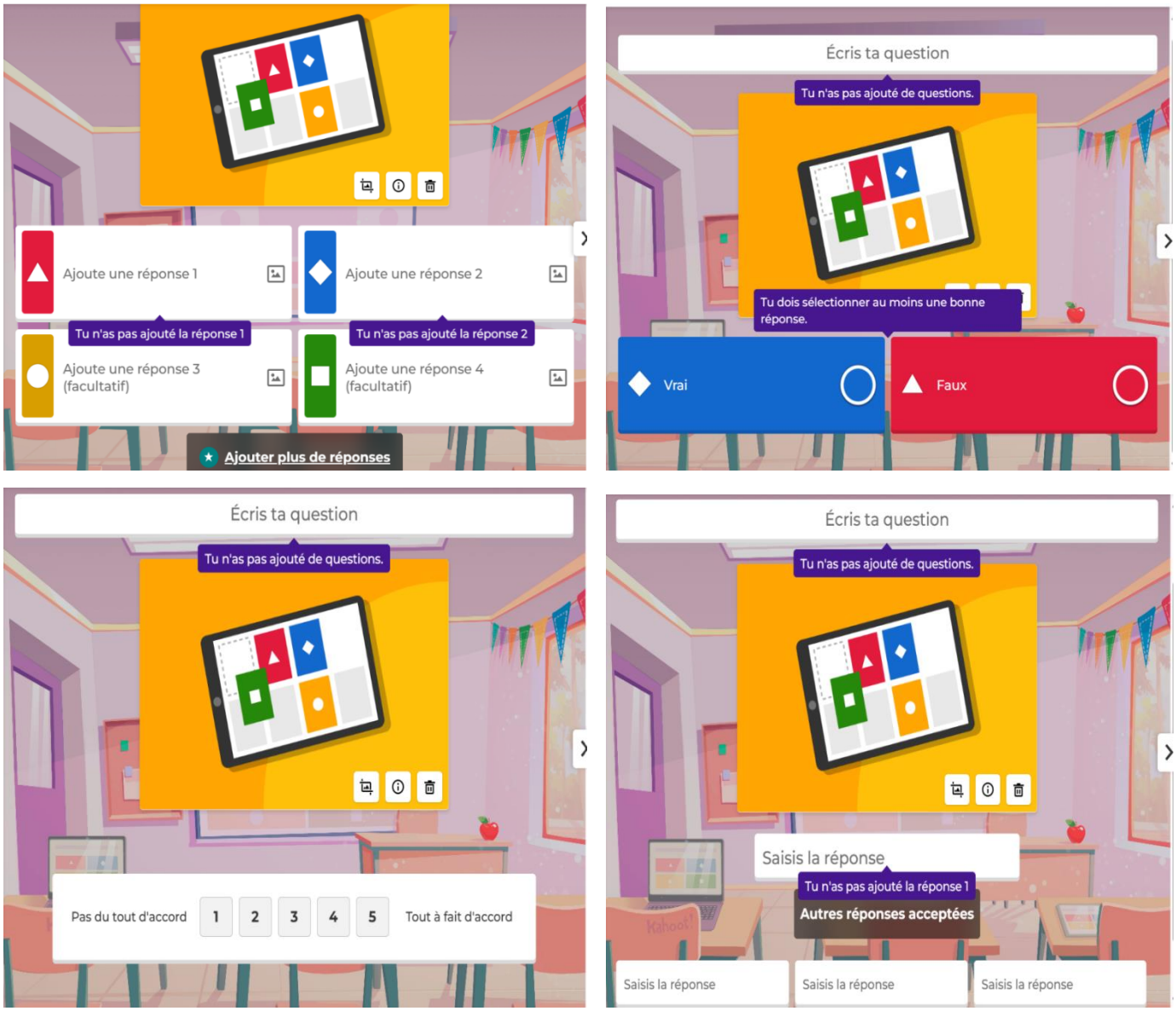
Fig. 3: Calligraphy illustrates the components of emotional goals related to gamification



In connection with the above image, it is evident that the application provides diverse educational options for teachers, placing a range of pedagogical alternatives at their disposal to enhance instructional effectiveness. These include language teaching, fostering communicative skills among learners, exploring new topics, and enabling teachers to assess and evaluate student learning (Tóth et al., 2019).

- ***Forms of learning with the Kahoot application***

Fig 4. Forms of learning with the Kahoot application (options)



As shown in the image above, it is clear that the educational interface of the application provides teachers with diverse options depending on the subject matter to be taught. These options include multiple-choice questions and ranking questions, as well as the ability to create content for assessing student learning through true or false answers. Moreover, it allows students the opportunity to respond in paragraph form and elaborate on their answers (Zhang & Yu, 2021).

Conclusion

In conclusion, it has become evident from the aforementioned discussion that the gamification strategy is not merely about playing for the sake of play. On the contrary, it serves as an effective pedagogical mechanism to invigorate learners and motivate them to persist in the educational process by gradually increasing the difficulty of the content presented. Furthermore, it reduces the margin of boredom, which has become a challenge for many teachers. This approach also values the experience of dealing with failure in learning, as outlined in the theoretical framework.

We also concluded that learning based on the gamification strategy involves using digital games beyond their usual purposes of entertainment and leisure. This is achieved through specialized digital applications such as Kahoot, which support and enhance learners' abilities and skills, ensuring their participation, commitment, and prolonged attention. Moreover, like other educational pedagogies, using the gamification strategy in learning and acquisition requires preparation and planning, as clarified by Soman and Huang's five-step learning model. Consequently, it can be acknowledged that learning through the gamification strategy can contribute to improving learners' educational efficiency.

Additionally, we invite researchers, particularly in the Kingdom of Morocco, to deepen their research into the roles of learning through gamification and its effects on other educational variables such as memory and motivation. These variables may provide us with a deeper understanding of this educational strategy.

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