

Gamification in education for the formative assessment process

Francisco Chavarría Oviedo

edonald221189@gmail.com

<https://orcid.org/0000-0001-9662-6902>

Universidad Nacional de Costa Rica

Karla Avalos Charpentier

tkarlah@gmail.com

<https://orcid.org/0000-0001-5028-082X>

Universidad Nacional de Costa Rica

ABSTRACT

This research examines the use of gamification as an assessment tool to assess students' learning of a second language in the different levels of education in this country. Also, the study describes several theories scholars have tested and implemented in different areas in order to provide insights on the implementation of it. In addition, this research attempts to identify not only the benefits but also the issues around it as well as explaining if gamification in education will have a positive impact for the students. To conclude, conclusion and recommendations will be provided to create a gap of opportunity for further research.

Keywords:

technology: *the application of scientific knowledge for practical purposes, especially in industry.*

Games: *a form of play or sport, especially a competitive one played according to rules and decided by skill, strength, or luck.*

Assessment: *the evaluation or estimation of the nature, quality, or ability of someone or something.*

Strategy: *a plan of action or policy designed to achieve a major or overall aim.*

Correspondencia: edonald221189@gmail.com

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La gamificación en educación para el proceso de evaluación formative

RESUMEN

Esta investigación examina el uso de la gamificación como herramienta de evaluación para evaluar el aprendizaje de estudiantes de una segunda lengua en los diferentes niveles educativos de este país. Además, el estudio describe varias teorías que los académicos han probado e implementado en diferentes áreas para brindar información sobre su implementación. Además, esta investigación intenta identificar no solo los beneficios sino también los problemas que la rodean, así como explicar si la gamificación en la educación tendrá un impacto positivo para los estudiantes. Para concluir, se proporcionarán conclusiones y recomendaciones para crear una brecha de oportunidad para futuras investigaciones.

Palabras clave:

tecnología: *la aplicación del conocimiento científico con fines prácticos, especialmente en la industria.*

juegos: *una forma de juego o deporte, especialmente uno competitivo jugado de acuerdo a reglas y decidido por habilidad, fuerza o suerte.*

evaluación: *la evaluación o estimación de la naturaleza, calidad o habilidad de alguien o algo.*

estrategia: *un plan de acción o política diseñado para lograr un objetivo principal o general.*

INTRODUCTION

Active methodologies in education are very important because they give the students an important role in their educational process; thus, these methodologies create autonomy and the development of critical thinking. Nowadays active methodologies are a must in every class due to the importance of making students have an active role in their own learning process. A very catchy and efficient tool that educators are using is the gamification. Games are attention-catcher and imagination developers. According to Buljan (2022) "Gamification for learning is a process that uses game mechanics to enhance learning." Having this definition in mind, educators can take many advantages when using games in education.

There are multitude of games, and variety of gamers styles. Games can motivate not only intrinsic but extrinsic motivation, and education needs to take advantage of this facts. Therefore, gamification is the process of using the mechanics of the games into an educational process and it represents a powerful tool for educators to motivate participation, loyalty and engagement into the learning process. Gamification in learning motivates students to work to accomplish a goal; it can be an individual, peer work, or teamwork goal. At the end the most important role will be putting into practice all the knowledge students have gained or identify which areas students need to improve or review more.

Gamification in education helps not only students in their learning process but also teachers as an evaluation strategy. According to Blankman (2022), "When implemented well, a gamified lesson keeps learning objectives the same but makes the learning process more fun." Students practice and have fun at the same time meanwhile teachers can assess the students 'performance in the activities they are developing. In that sense, it is required to make an analysis about the use of gamification in education as a tool for assessing the learning process effectively and at the same time erase skepticism around it mostly when it is used in evaluation.

Together with the application of gamification in education, comes the question about which games suit better the necessities and how to assess the process thus it will be translated into the students' performance to achieve the goals proposed in the curriculum.

Presentation of the Problem

Gamification has become an essential tool in education. Though games teachers and students have a way to track progress and identify weaknesses and strengths. Therefore, the question is how Gamification in education helps in the process of formative assessment.

Analysis of the Problem

For most teachers, evaluation has always represented a challenge in many ways. For instance the standardization of testing systems in this country, teachers do not know the relevance of formative assessment in the process, confusion around the process of evaluation for many people understand formative assessment as something done to the students and not with them, the approaches needed to be applied, philosophies, accountability, how to use the results obtained, students asking about the process of evaluation and the grades they “got”, strategies, the fact that formative assessment is actually for the learner and not for the parents, time, among others.

The formative evaluation according to the CCSSO and cited by Beard, E (2021), is a planned process that teachers and use in order to obtain evidences of students ‘learning and with the purpose of analyze data in order to make students improve their learning. In addition, formative assessment is performed during the whole course term, to confirm if students are reaching the objectives proposed. In this way, the students will know their weaknesses and strengths in which they will find also the stimulus required for a systematic study. Formative assessment is attached to the feedback for it allows facilitators to show and identify the deficiencies in the process. As not all the systems to evaluate in gamification are so obvious it is extremely important to visualize them to maximize its effectiveness. Marczewski (2013) states that in the game world, constant and instant assessment is used all the time. On the other hand, gamification in formative assessment pretends to show information to the students to make them change the way they think or the way they behave with the only aim to improve learning. Moreover, through the gamification, professors can change the objectives as they focus on the students as the most important part of the evaluation. Effective gamification evaluation process goes really close with effective feedback, in such a way, learners can understand clearly the goals and how to perform accordingly. Feedback used correctly has a positive effect on the learning process as long as it is task focused and not in the competition.

Theoretical Framework

What is gamification?

According to Van Grove (2011), gamification refers to “ it is to change something that is not a game through a game or its elements”. In gamification, two main purposes are to solve problems and to follow a process with an specific objective.

Kim et al. (2018) stated that “Gamification in learning education is a set of activities and process to solve problems related to learning and education by using or applying the game mechanics.” In the learning process, the teachers should recreate a real-world environment to face students to experiences that will be useful during their lives.

Types of games

1. Serious game: it is developed with a specific purpose but not only to have fun.
2. Simulation game: it simulates real world
3. Alternate reality game: it employs real world media

Reasons for Gamification in Learning and Education

The influence of technology in the past years have been grown increasingly and the impact in education is not the exception. With the use of technology new apps, devices and online resources educator can incorporate new approaches such gamification that is a new trend in education to enhance motivation and engagement through the use of games. It can be used to motivate learners to get involve in class and encourage desired behaviors.

Gamification is not just designed for entertainment, is also an instructional approach that can be used to enhance the effectiveness of instruction on students’ learning. Applying this methodology for educational purposes, educators can be able to:

- Increase student engagement and motivation
- Enhance learning performance and academic achievement
- improve recall and retention
- provide instant feedback on student’s progress and activity.
- Catalyze behavioral changes
- allow students to check their progress
- promote collaboration skills. (Kim, et al, 2018)

These positives aspects can achieve students goals as a result of gamifying teacher instructions to make their learning more engaging and dynamic.

Engagement and flow Theory

Engagement is something that educators are interested to achieve with students in their classes. Engagement is the heightened simultaneous experience of concentration interest and enjoyment in the task hand. (Shernoff, 2013., p.12) and a level of affective, behavioral, and cognitive involvement during a task. This theory states that students' engagement level is high depending on the given task. Moreover, the learning environment should be relevant too. In the flow theory there are four mental states: anxiety, apathy, boredom, and flow. Among them, flow is an optimal state for learning as it influences learning and academic achievement. (Csikszentmihalyi,1990) .

Considering these four mental states, educators must be careful when choosing activities. Csikszentmihalyi (2004) argues that individuals will engage in an activity when the activity is sufficiently challenging and performable. If the activity is too challenging compared to an individual's skill, the individual tend to feel anxious and sometimes gives up trying to perform the activity. On the other hand, if the activity is too easy, the individual may feel bored and not want to perform the activity. Taking into consideration these aspects, looking for the best games to accomplish educational goals is an important and demanding task. Therefore, some important components that every learner experience with flow are the following:

- Challenges match skill
- Clear goal
- Control
- Direct feedback
- Loss of self-consciousness
- The activity becomes autotelic
- Transformation of time. (Csikszentmihalyi, 1997)

Over Engagement or Addiction.

The use of a game in education is an attractive tool to implement as a mediation strategy. Nowadays students are immersed in the use of technological devices, such as smartphones, tablets, and computers. Therefore, educators take advantages and use this positive attitude towards technology as a meaningful way of learning. Nevertheless, educators should be careful with some negative aspects related to over engagement addiction and anxiety.

Young (2009) argues that it is important to know the warning signs or symptoms of game addiction or over engagement. The researcher includes the following behaviors as warning signs or symptoms:

- playing the game is the top priority
- losing interest in other activities or hobbies
- becoming less social and spending more time alone
- preferring friends within the game to existing friends or family
- getting angry when deprived changes to play the game
- continuing to play the game in spite of the results negatively influencing real life

When deciding to use games in class, it is important not to overuse them, and be careful about the negative aspects they can bring to the students and therefore to their learning process and behavior.

Theories for Gamification in Education

Motivation Theory

If something can influence the success of gamification, that is motivation. Motivation is the process that starts, guides and keeps goal-oriented behaviors. It is the reason to act or to do something. Motivation can be intrinsic, which is arose by the individual's desire, curiosity or interest. Ryan and Deci (2000) define intrinsic motivation as "the doing of an activity for its inherent satisfactions rather than for some separable consequence" (p. 56). Intrinsic motivation is necessary to trigger personal satisfaction. When it comes to academic achievements, intrinsic motivation plays a key role. On the other hand, extrinsic motivation refers as the tendency to participate in activities to gain a reward either tangible or psychological. According to Ryan and Deci (2000), extrinsic motivation is "a construct that pertains whenever an activity is done in order to attain some separable outcome" (p. 60). Professors need to consider the right strategies to motivate this type of motivation as it may not continue when the external factor is not present and the later can decrease intrinsic motivation. Careful selection or a combination of the type of motivation that should be applied depends on the population and the goal of the activities.

Self-Determination Theory

This theory refers to the assumption that individuals 'motivation can be affected by the environment, considering social and cultural factors. Also, it considers people's needs of

autonomy, relatedness and competence. In order to grow, people need to feel they own the control of their behavior with the consequences of it; they need a sense of belonging and interaction with a group and, that they have the ability to complete different tasks. Facilitators can motivate autonomy by giving students the opportunity to choose for instance the projects they want to research about. Again, rewards for extrinsic motivation should be carefully selected thus it does not ruin intrinsic motivation leading autonomy. Tasks must fit the level of competence so they are not significantly easy or difficult for the students, they should be challenging to promote intrinsic motivation but at the right level. Another way to experience growth is relatedness. The way teachers, students and parents relate will affect the motivation and the way they engage with the activities in the classroom.

Achievement-Goal Theory

This theory also called task-involved and ego-involved goals, suggests people can be motivated by the desire to pursue a specific goal. According to this theory, there are two major types of goals: mastery and performance goals. Mastery goals refers to get the skills required to perform a task or understand a concept. Performance goals refers to the desire to probe higher achievements than some other people. Therefore, people with performance goals are concerned with a social comparison and the results and, people with mastery goals mostly show high self-efficacy, quantity, quality and academic achievement (Linnenbrink, 2005). Attention should be paid to the negative influence of performance goals over self-efficacy and motivation. Furthermore, performance goals are more effective to boys than girls in competitive learning situations (Midgley & Kaplan, 2001). Consider also that to achieve goals is not something fixed, on the contrary, it is dynamic, and it may change with time. To answer the questions about the evaluation of the learners' achievements it is required to apply to criterion-referenced tests and norm-referenced tests. The first one to evaluate the mastery goals and the second one to evaluate the performance of the goals and always considering the learning environment and the students features when applying these types of tests.

Social Learning Theory and Situated Learning Theory

Also known as SLT, this theory states that people can learn from observing others, the way they behave and the results of that behavior. Learning is also social interaction. Social learning sets four principles: attention, retention, motivation and reproduction.

According to Bandura (1977) to succeed in social learning, it is necessary to watch people's behaviors, remember them, be able to recreate those behaviors, and have motivation to perform the same ones. That is why it is important to give students the chances to observe models. It may be another student, a teacher or even the parents or maybe someone else from outside the classroom. Simulations and specific learning materials provided by teachers will allow students to learn and interact with and model the desired behaviors.

Situated learning theory claims that learning happens throughout social interaction. The name comes from the idea that learning cannot be separated from the activity where it occurs considering context and culture (Lave, 1988). In that sense, learning scarce of authentic context makes more difficult its application to the real world (Collins, Brown, & Newman, 1989). Some of the core principles of this theory are that knowledge requires authentic context and, social interaction is necessary for effective learning. For that matter, social interaction promotes learning and cognitive among the novices' enculturation by giving students the opportunity to interact in authentic environments.

Feedback

According to Brookhart (2017) feedback is one of the most effective ways to facilitate learning. Feedback is a way to evaluate students' performance through a verbal or nonverbal message. It can be positive or negative. Positive feedback supports, encourages and emphasizes on strengths. Negative feedback is concerned on how and what needs to be improved due to poor or weak performance. If delivered correctly, both positive and negative feedback can be effective in teaching. Considering the evaluation, feedback can be internal or external. Also, feedback can be monitored by individuals in terms of goals, skills, knowledge and strategies. Even more, feedback timing can be either immediate which is more effective, or delayed. The way used to give feedback must be carefully chosen. It could be given by oral messages, gestures, facial expressions or through multimedia. The best way to give feedback is by reflecting on students' performance to guide them to improve it and, as always facilitators must consider students' context and individual characteristics.

Gamification Strategies

Several strategies can be found in the literature regarding gamification. nonetheless some relevant concepts that stand out are the following:

Objectives: the objective needs to be thoroughly analyzed before any activity is presented in class. In addition, objectives need to be clearly stated and shown to students to have a north, and not having problems or feelings that the activity is just a waste of time.

Learners characters: literature overall shows that it is necessary for educator to evaluate and learn about students' attitude towards games so these can be planned respectively since personalities vary from group to group.

Evaluation and Improvement: a great strategy in gamification is that academics usually claim that one of the benefits about gamification is that it can be put into practice to be later evaluated, so feedback can be obtained and use it for improvement.

Resolution of the problem

The interest of educators to help and engage students during their learning process is a constant challenge and gamification is one of the approaches used for education purposes.

One of the concerns to use gamification for educational purposes, is how to assess the activities using this approach. Regarding to the problem presented in this investigation we conclude that it is important to consider the following aspects:

- Tutorial level: in each activity it is important to present a tutorial practice which measure the previous knowledge of the students, and identify the most common mistakes, and take that as a reference to evaluate students' knowledge.
- Gather mistakes: Identifying the mistakes from games and activities shows teachers in which skill or topics the learner struggles the most, designing similar questions to identify students learning from mistakes and to see if they improve the difficult questions; therefore, educators are able to know what to evaluate.
- Taking into consideration this aspects, we can find that use of gamification provides a positive attitude towards English language, motivation in learning English is increasing in students which shows less interest in the subject, and students are able to practice the four skills while reinforce the weakness skill. Regarding these positive results, students can know their progress as soon they conclude the activity, and educator is able to assess students through the game with formative feedback, interviewing students' experience about the game or activities or by applying surveys. Nevertheless, it should be important to incorporate a written test based on the

content of the activities and items provide during the game, in which students have the possibility to acknowledge their own mistakes.

Assessment

The main purpose of evaluation is the diagnosis, control and classification of information. There are three types of evaluation; summative, formative and diagnoses. The latter should be evaluated at the very beginning of the course in order to know if the students suit the necessary requisites to carry it out. Formative assessment refers to the control process through which the facilitator analyzes whether the students are reaching the objectives or not. Students find out their mistakes and hits and receive feedback that allows them to identify a course of action to improve. Summative evaluation happens after the activities when students have noticed the results at the end of a cycle or a quarter.

In order to be successful in evaluation, teachers may required the conjunction of the three types of evaluation, which are tied to each other. It is necessary to consider that the evaluation methods applied in education have a regulatory function which ensures the relationship between the characteristics of the students and the features of the training system (Bonniol & Vial, 2001). A form of regulation will be to ensure that the students feature meet the requirements previously listed in the curriculum. In this sense, evaluation is a tool to ensure students progression from the beginning to the end of the educational process.

According to Bonniol & Vial (2001), states that formative assessment really contributes to identify effective procedures and formalize them sufficiently to facilitate its implementation. Furthermore, close analysis should be made to the close relationship between the formative assessment practice and other components of the teacher's pedagogy. Thus, the evaluation of the learning process could enable decision making and improve the quality of teaching, by giving information about the actions in development and the necessary adjustments. The whole process give validation to the teaching-learning process as it provides evidence of the learning. The evidence will also provide information to the teacher and the student and it will give guidance about the decisions that need to be made about the quality of the program. To improve the quality of this process it is a must to consider the time interval between the finding of the evidence and the course of instruction.

In accordance with Leaning (2015) stated that

“students tend to be more comfortable in gaming environments, they also feel relaxed due to the positive atmosphere that considers failure as a normal part of learning. Students in a gamified classroom are able to show intrinsic motivation towards the subject matter, especially that fun becomes a major part of learning. In addition to that, students have the chance to look into various identities through avatars (characters) which enhances creativity.” (Ibrahim, 2019)

The gamification has the power to change the students’ perspective towards a subject matter or towards a homework or assessment. By using gamification in the classroom, the teachers can integrate the procedures or strategies to achieve a goal and simultaneously to improve their students’ performance.

Another important result seen during this research is the use of technology could promote positive effects in the formative assessment. Prensky (2001) believed that the use of video games in classroom for educational purposes is one of the tools that the new generations are applying for learning process.

The evaluation is the way to review the students’ progress and it is a form to control or to improve the quality of teaching. During the games, the students are implementing assessments through different actions, they are interacting, solving problems, and the evaluations within the game activities could deduce what learners know about any aspect, or what learners do not know. (Menezes, 2016)

Finally, the gamification has valuable advantages such as enjoy and actively engagement during classes, students remember what they learn for a longer period of time, students create their own experiences, students complete tasks increasing efficacy and confidence, the skills of thinking are improved, to foster student’s motivation and engagement and to promote retention.

CONCLUSIONS

Implementing gamification in the classroom offers great results for educators if the games have clear objectives; therefore, teachers need to be careful with the selection of the game and not overuse them.

If the students do not have a clear understanding about the activities, students might not feel engaged in the games. In this regard, it is of great importance that professors take

special attention to the games they will be using, what is trendy regarding student's interest, as well as explaining to the students the objective of each of them so students will not feel that they are just losing time.

Gamification improves and fosters motivation in students. The use of games brings out an environment that promotes a fun and relaxing zone where students can participate actively while being able to show the expertise they have learned throughout the lessons. Also, academics in general have found that games help get students engaged and more interested in the topics being studied or reviewed.

Gamification is a powerful assessment tool to consider when assessing students' progress and provide feedback to students. Besides that, it can give teachers a perspective of what they are doing as a self-revelation process where contents are put into practice. In this way, students, programs, contents, teachers, and others can be assessed in a direct but different way.

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