

Gamification in the Classroom at a Higher Level: Application in an Accounting Course

Hector Miguel Gonzalez-Neri^{1*}, Rafael Albertti Gonzalez-Neri², Aaron Ivan Gonzalez-Neri³
and Jovita Georgina Neri-Vega⁴

^{1,2,3,4}Autonomous University of Queretaro, Santiago de Queretaro, Mexico.

*Corresponding author email id: hector.gonzalez@uaq.mx

Date of publication (dd/mm/yyyy): 16/04/2025

Abstract – In this research the application of gamification as a didactic strategy is presented, the objective is to relate a game dynamic applied to the structure of the international environment, specifically with the subject of International Accounting, which has a business focus, considering that currently countries live in a globalized environment and the need arises to know the ways of doing business of other countries, this work was developed focused on students of the Bachelor's Degree in Public Accounting of the Faculty of Accounting and Administration, San Juan del Río campus, of the Autonomous University of Querétaro, whose age ranges between 18-20 years. The institution is state-owned, with young people who have the strength that they are very interested in technology. A methodology based on gamification was applied as a learning strategy, using the kahoot platform as an evaluation tool. It is a documentary research with a qualitative approach, according to the methodological approach of design-based research, specifically the design of the didactic sequence and gamified scenarios, given that it intends to improve existing teaching proposals, in addition to the need to go in search of pedagogical environments that change traditional educational models. The results of implementing the didactic strategy showed the acceptance and effectiveness of the proposed gamified methodology, due to the positive response from the students, since, when using innovative didactic tools as a strategy for the achievement of objectives, it could be observed that they were effective to the extent that the students accepted the proposal with enthusiasm and modified their way of acquiring knowledge in a creative way, also participating in a socialization process that promotes motivation and learning.

Keywords – Gamification, Strategic, Learning, Higher Level, Accounting.

I. INTRODUCTION

This paper presents the application of gamification as a didactic strategy focused on students of the Bachelor's Degree in Public Accounting of the Faculty of Accounting and Administration, San Juan del Río campus, of the Autonomous University of Queretaro, the age of the students ranges between 18-20 years. The institution is state-owned, with young people mostly from limited resources, with the strength that they are very interested in the use of technology, the groups can have up to 40 students, however, there are semesters (as in the case of this work), where the students are between 12 and 20, the institution is located in the Center-Bajío of Mexico in the city of San Juan del Río, Queretaro. The objective is to relate the structure of the international environment with the subject of International Accounting that has a business focus, arguing and demonstrating that currently countries live in a globalized environment and the need arises to know the ways of doing business in other countries, especially those with which there is a commercial relationship. To achieve the above, a methodology based on gamification as a learning strategy will be applied, using the Kahoot assessment tool. Gamification theoretically focuses on the fact that games are motivating and attractive tools for students and in recent years, the concept of gamification has become a priority topic in many schools as a form of methodological innovation. It is convenient that when applying the use of gamification strategies in the area of social sciences, a characterization of the group of students is considered that allows the teacher to plan activities that respond to their potentialities, needs and particular interests, as well as to adapt the games to the age and characteristics of

the group of students. After having obtained the criteria of the specialists consulted and considering their suggestions for the improvement of the didactic strategies, they will proceed to their implementation in practice.

II. LITERATURE REVIEW

A. *The Game*

The game as a concept in general is very broad, includes challenges, motivation and strategy and can be implemented in various areas. In education, play helps us to make it easier to acquire knowledge and in reality, the process is very similar to what we do in daily life. As Koster (2022) says, the game seems to be abstracted from reality, since it is an iconic representation of real-world patterns, games are puzzles to solve in the same way as everything we face in life.

Games have rules and also objectives, according to Koster (2022), when we manage to learn or master something, we secrete chemicals, which makes us feel good, our brain feels good about the release of endorphins. In addition to the great stimulation to the brain and the improvement of various skills. Play is a great tool in education.

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B. *Gamification*

"Gamification is born from the learning provided by games, their mechanics, tools, developments, coping and the way in which people are satisfied through the offer of rewards and/or stimuli for tasks carried out in one way or another in areas not necessarily related to play." (Contreras & Eguía, 2017).

It is not mandatory that gamification is established through technology, the strategy can be carried out in the physical world and with elements that are within reach, everything depends on the creativity of the teacher himself, while on the part of the students, there is usually already an extra motivation for the simple and simple fact that an activity is related to a game. We can also recover some of the components of gamification such as the reward system and add it to any proposal for class activity.

Teixes (2015) proposes a definition based on several definitions by other authors: "Gamification is the application of resources typical of games in non-ludic contexts, in order to modify the behaviors of individuals, acting on their motivation, in order to achieve specific objectives".

It is possible to recover several resources from games that are very attractive and make the teaching-learning process more interesting and attractive, it can even be applied to another context different from that of education. This causes both the student and the teacher to feel more motivated to participate, "the desired change in behavior is obtained by aiming at motivation" (Teixes, 2015). Motivation is very important in gamification, after all it is something we do even when we are adults. The motivation that arises from competing, overcoming a challenge and achieving some prize, that natural in the human being.

Gamification is not just about transforming learning into a game, it is a strategy that takes advantage of the intrinsic motivation of students (Tobares, 2023).

It is not enough to think about turning an activity into a game, you must also consider the consequences of gamifying a process, what is going to be achieved and what is going to be needed.

Intrinsic motivation "seeks to develop activities in order to obtain external rewards in the form of money, praise, etc." (Teixes, 2015).

The intrinsic motivation has to be well thought out, some prizes related to the qualification can be added or even not. If the prize is very high, the student can concentrate on winning that prize, leaving aside learning, otherwise, he could question whether it is worth participating without any prize.

C. Points, Rewards and Leaderboards

The current generations are very familiar with video games and the points and rewards system. Including this system in an isolated activity is not usually very complicated, although in an entire course it does require a great deal of time to prepare the strategy. Points can be assigned for each correct answer or "badges" can be used for the most active participants, the most punctual, the fastest and even the most organized. Many applications show a leaderboard, which is an element that "visually orders the players of a gamified system according to the achievement of the proposed goals" (Teixes, 2015). Kahoot always shows us this type of board at the end of an activity and it works precisely as a motivating element, since it only shows the first places, leaving aside those who were in last place so that they are not exposed and lose motivation. While in general, everyone wants to appear on this board that shows a summary of the points obtained.

Although many applications provide us with the majority of a gamified system, we can have great diversity in the construction of the strategy. The strategy can be organized individually, through an application and making use of technology. Although for a face-to-face environment, collaborative work can be used and this also helps students to have a better tolerance for different opinions and organization when working as a team.

III. METHODOLOGY

Study Design: This is a documentary-type research with a qualitative approach, where in the first instance the students of the Bachelor's Degree in Public Accounting, in the subject of International Accounting, will investigate about aspects related to 10 Asian cities, considering eight aspects in each one, later the professor coordinates the presentation of the topics, to then implement, develop and carry out an evaluation through kahoot, according to the methodological approach of design-based research (De Benito and Salinas, 2016), specifically the design of the didactic sequence and gamified scenarios, given that the intention is to transform and improve existing teaching proposals.

It is considered of utmost importance that before applying the gamification strategy, students must have prior knowledge, both in accounting and in the area of international business, which is the topic that will be addressed in the research. This will be carried out in the first phase of the design, that is, in the research that the students will carry out. The total time of the application of the game was two weeks, starting with the theoretical research, then the preparation of summary sheets for each of the cities and the subsequent evaluation, with the gamified methodology (Delgado, 2024). It was carried out in the Public Accounting career, with fifth semester students of the International Accounting subject, 12 students, taking Asian Cities as the learning topic. Nowadays there are many ways to help students remember what they have learned or not to forget it, to reinforce learning or to learn something new, one of the ways to do the aforementioned is through the game. When students do homework, they reinforce what they have learned, but sometimes these tasks are monotonous or boring and the student ends up hating doing homework. The same thing happens in classroom classes,

students hope to learn something new, reinforce what they have learned during the week, or simply review what is difficult or what was not so clear. All this can be achieved by transferring the dynamics, mechanics and elements of the game to an educational environment, in order to convey a message, motivate students, promote positive values and healthy competition, to achieve results that make learning more fun. What is proposed in this work is that both the teacher and the student enjoy the work that each one does; the student learns by playing and the teacher teaches by having fun. There is no longer a limit regarding the use of innovative materials, since there is a large number of web pages, which provide a large amount of materials, which can even be obtained with free access.

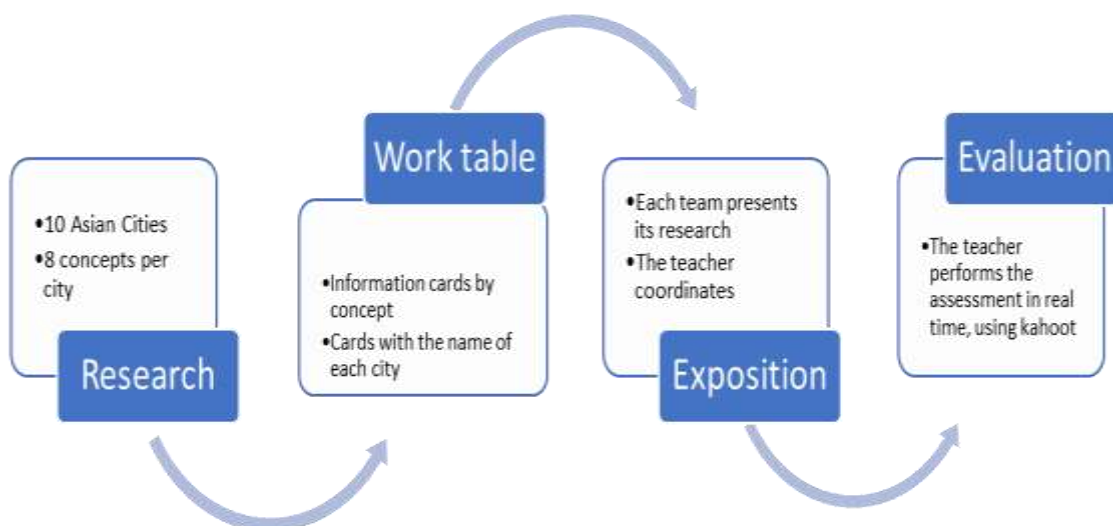


Fig. 1. Didactic Sequence. Source: Retrieved from Benito and Salinas, 2016.

Game Name: Getting to Know Asian Cities.

Game content:

Research will be conducted on 10 Asian cities which are as follows:

- Hong Kong, China.
- Tokyo (Japan).
- Macao (China).
- Beijing (China).
- Bangkok, Thailand.
- Shanghai (China).
- Ho-Chi-Minh (Vietnam).
- Chengdu (China).
- Shenzhen (China).
- Seoul (South Korea).

The following key concepts will be considered, 8 for each city:

- Main economic activity.
- Presence of Multinational Companies (national or foreign).
- Number of Universities.
- Type of transport.
- International Airports.
- Hotel chains.
- Currency.
- Language.

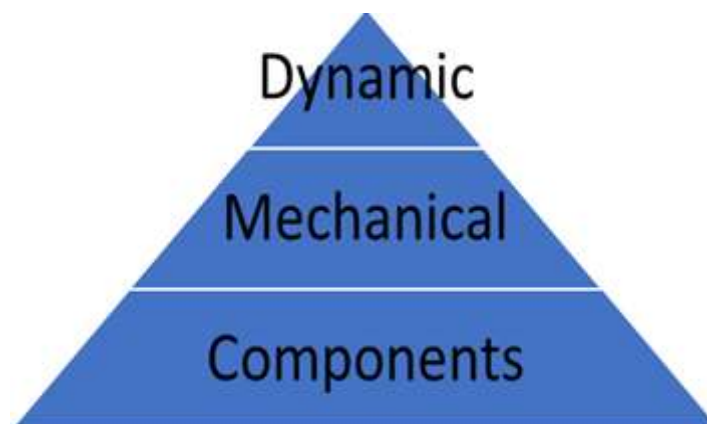


Fig. 2. Game Elements. Source: Retrieved from Werbach and Hunter, 2012.

Characters (optional): In case of competing as a team, the members can appoint one representative per team.

Components: Each of the eight concepts was grouped with each corresponding city. Once the research phase has been carried out, the students make a presentation of the researched work to the group, this is intended for all students to know the work researched by their classmates, since when talking about ten Asian cities, some may coincide in some concept, such as language, currency or some other aspect, but it may also be that some city is very different and considering that each student (or team) has carried out research on only one city. The presentation phase is a moment of proposing the researched knowledge through a narrative to the other classmates, in this part the students share the information obtained in a "virtual trip", compare it and in turn reinforce what has been researched, the teacher coordinates the presentations and gives feedback on the information presented at this stage.

Narrative:

A work table was used, where the students made information cards referring to each of the eight key concepts, the information is summarized here, highlighting the important aspects, as well as information cards with the names of each city.

Timing:

The game was carried out in two weeks, enough time to carry out all the activities mentioned, at the end an evaluation was carried out with the kahoot tool coordinated by the teacher, you can return to the game in case of

not achieving the required learning, that is, not having obtained the scores requested and established in the dynamics of the game.



Fig. 3. Kahoot Game Screen. Source: Own elaboration.

Several dynamics can be applied, depending on what you want to achieve:

"Reward dynamics: It serves to generate a new interest in something, giving rewards to the participants. The incentive facilitates execution because of the expectations it creates, and for this reason the value of the incentive is learned. Competition dynamics: It serves for participants to strengthen their knowledge on the subject through a competition. Achievement dynamics: It is about defining a possible challenge and objective to be achieved by the participant. Progression dynamics: The participant notices that they are advancing and improving their score.

When carrying out the activities, several mechanics can be applied: Point mechanics: Points are necessary in all types of games, as they make the participant more eager to continue playing, encourage them to improve and serve to control the progress of the players. Level mechanics: In addition to controlling the player's progress, each time the level is higher, the difficulty increases. Challenge mechanics: It increases the participant's motivation, it is a priority of gamification and it is done through more difficult challenges each time, each challenge proposes a challenge and thanks to the challenges, the participant can get rewards. Gift mechanics: A good game must be complemented with this type of virtual products that complement the game experience, virtual coins can be awarded. Leaderboard mechanics: A leaderboard of players and their score is made, to increase healthy competition among the participants. The player can see what state he is in and if he has to improve to achieve a better position" (Lopez, Garcia, 2017).

The best outstanding participant (team) goes to a better ranking. The challenge is to obtain the highest score related to the concepts of each city, in the established time. They compete individually (between teams if there are many students). The participant (team) with the highest number of points achieved in the shortest time, wins the game.

"Games often involve the practical application of knowledge and skills, helping students develop competencies that are directly transferable to real-world situations. Gamification makes it possible to adapt content and difficulty according to individual needs, which makes it possible to address differences in the pace

and learning style of each student. Gamification can foster collaboration between students and healthy competition, which promotes collaborative work and the improvement of social skills, skills that are equally important in today's work environment" (Ortiz-Colon et al., 2018).

Evaluation Methodology

Kahoot is a free platform, which allows the creation of questionnaires for evaluation. The most recommended and used is the Quizz type. With this tool, the teacher creates competitions in the classroom to learn or reinforce learning and in this way the students are the contestants. Students choose their alias or username and answer a series of questions using a mobile device or computer.

The questions, once created, can be reused or even modified to ensure learning. The configuration of the game is important, the valid option or options must be marked, the points that each question will be worth and the time needed to answer with a maximum time in minutes per question.

The game in kahoot will be played in a computer room requested for the event, the teacher will make a multiple-choice questionnaire that will be answered by the students in real time. The game in kahoot can be played in the classroom, as long as the students have access to the Internet and a device.

Successes are obtained in the moment. The participant (team) that manages to obtain the first place in the total number of correct answers in the established time, wins the game, obtaining the previously established reward, which is the environmental object that is known in advance that will be achieved if a certain execution is carried out and attracts the person to perform it. It is the motivational component of action. (Ávila, Gómez, 2017).

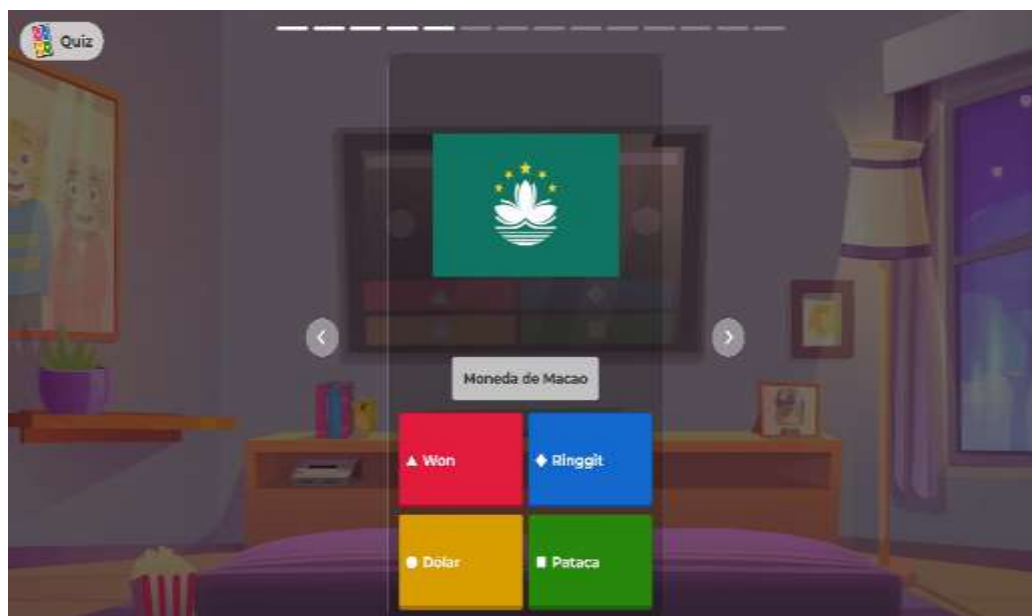


Fig. 4. Macau currency question. Source: Own elaboration.

The results are obtained at the moment and in this way the players receive feedback, to know how their performance in the game is going and how much time they have left in the game to achieve the objective, it is a competitive phase, where the students pay their greatest attention to answering the questions correctly, to have the greatest number of correct answers.



Fig. 5. Real-time results of the game scoreboard. Source: Own elaboration.

IV. RESULTS

From the experience with the pandemic, the University has had to change the teaching-learning process, considering new scenarios in the different actors, professors and students, in this way online teaching played an important role in that period, however, it is well known that this type of way of working is here to stay since many institutions made important adaptations in terms of equipment, technology and structure, which today must be taken advantage of and exploited, (Alvarez-Alonso, 2023), although it is true that the Faculty of Accounting and Administration offers face-to-face programs, this does not prevent these classes from being supported by technological elements, which were implemented in the aforementioned era.

The results of the research helped to highlight the importance of incorporating technological resources in the classroom, which made it possible to establish a relationship between the topics of the content of the educational program with current aspects such as technology and recent educational tools, the methodology used allowed the experience to help students turn a hobby into a class with content, to better assimilate information and retain it, transforming the experience and taking learning beyond the classroom.

In this research, only the aspects related to the manifestations received from the students are presented and therefore it refers only to a qualitative approach to a practical tool that is gamification. Alvarado and Rosado (2023) state that this type of strategy offers students the opportunity to increase their problem-solving skills, make decisions, and work collaboratively among students.

Screenshots of the results obtained in real time when playing the game are presented, using Kahoot as an evaluation element, which is a widely used and popular tool in the university environment and has gained notoriety in recent years, because it is free to access and offers the opportunity for feedback to the student. It also allows the content of the class to be adapted to the level of knowledge of the group. Students can access the game through a mobile device, tablet, computer, or any electronic device with an internet connection. (Gimenez Leal & De Castro, 2020).

By using innovative didactic tools as a strategy for achieving objectives, it was observed that they were effective to the extent that students accepted the proposal with enthusiasm and modified their way of acquiring

knowledge in a creative way. Valuing a job well done, providing positive feedback, and fostering an environment of autonomy and creativity are strategies that can enhance students' intrinsic motivation (Del Carmen Pegalajar, 2021).

V. CONCLUSIONS

The objective of the research was fulfilled, by being able to relate a game dynamic applied to the structure of the international environment, with the subject of International Accounting. It was possible to verify that digital gamification allowed to generate a fun environment, where aspects such as competition, ranking, feedback and above all motivation stood out, allowing the development of the program's contents to be carried out in a dynamic way.

The game allows us to get closer to reality and learn at a certain moment from the mistake and correct it, this leads the student to learn a certain topic through the successes or mistakes made, considering that it is a game, but then realizing that each mistake is an opportunity for learning and growth necessary to achieve the objectives.

In terms of methodological sequence, in order to achieve a good design of educational games, not only the learning objectives must be considered, but also the way in which gamification will be integrated into the classes. This means that it is necessary to implement specific competencies, which are all those skills, knowledge, values and thoughts required to adequately develop a task or a job.

Unlike basic and general skills, which are only useful for a specific field, and in order to develop them it is necessary to carry out learning designed for them. (Esibe, 2024) As for evaluation, there is undoubtedly an important aspect to highlight and that is the technology that allowed access to online gamification, since the evaluation part requires a real-time session.

In previous periods, this game was applied without the use of technology, but as mentioned above, after the pandemic the teaching-learning processes took a turn, in addition to the fact that the training of teachers in areas of technology was not only necessary, but indispensable at this time, however, currently teachers are required to be trained in teaching techniques in their area of knowledge, in didactics and technology.

Another important aspect was undoubtedly the socialization process that modifies behavior by the intervention of other individuals in a sequence of relationships that fosters perception, motivation, learning and adaptation through the exchange of rules and affirmations. According to Mateus (2014), in order to model human interrelation, it is necessary to model individuals in a social context, interrelating them with the requirements of social action, which are: having objectives, adaptation of means to objectives, and the integrating power of each of them in the group through norms and maintenance of a model in the socialization process.

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AUTHOR'S PROFILE



First Author

Hector Miguel Gonzalez-Neri, Was born in Distrito Federal, México, Accountant, graduated from Autonomous University of Queretaro, Master in Administration with specialty in Finance, Doctorate in Education, teacher in accounting area in Autonomous University of Queretaro, free time teacher Autonomous University of Queretaro, last post: La función tutorial como apoyo a la función docente en la era digital. [The tutorial function as a support for the teaching function in the digital age.] (2024), in Revista Internacional de aprendizaje [International Journal of Learning], Common Ground Research Networks. Research area: Innovation and Competitiveness in organizations.



Second Author

Rafael Albertti Gonzalez-Neri, Was Born in Distrito Federal, Mexico. Computer Systems Engineer, graduated from Instituto Tecnológico de San Juan del Río, Master in Communication and Education Technology, Doctorate in Education, teacher in Autonomous University of Queretaro, full time teacher in Autonomous University of Queretaro. Independent consultant in computing area. last post: La función tutorial como apoyo a la función docente en la era digital. [The tutorial function as a support for the teaching function in the digital age.] (2024), in Revista Internacional de aprendizaje [International Journal of Learning], Common Ground Research Networks. Research area: Educative technology.

email id: rafael.albertti.gonzalez@uaq.mx



Third Author

Aaron Ivan Gonzalez-Neri, Was Born in Distrito Federal, Mexico. Computer Systems Engineer, graduated from Instituto Tecnológico de San Juan del Río, Master in Communication and Education Technology, Doctorate in Education, full time teacher in Autonomous University of Queretaro. Last post: La función tutorial como apoyo a la función docente en la era digital. [The tutorial function as a support for the teaching function in the digital age.] (2024), in Revista Internacional de aprendizaje [International Journal of Learning], Common Ground Research Networks. Research area: Educative technology. email id: aaron.ivan.gonzalez@uaq.mx



Fourth Author

Jovita Georgina Neri-Vega, Was born in Hidalgo, Mexico. Accountant, graduated from Autonomous University of Queretaro, Master in Administration, with specialty in Finance and International Trade, Doctorate in Administration, full time teacher in Autonomous University of Queretaro, last post: La función tutorial como apoyo a la función docente en la era digital. [The tutorial function as a support for the teaching function in the digital age.] (2024), in Revista Internacional de aprendizaje [International Journal of Learning], Common Ground Research Networks. Press. Research area: Innovation and Competitiveness in organizations. email id: jovita.neri@uaq.mx