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Motivational impact of gamification on higher education students from the perspective of Spanish speakers

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— Abstract—

In education, Gamification has emerged as a preferred strategy due to the dynamism it provides to classes, increasing student engagement and motivation. This last reason has inspired the present article, whose aim is to identify the motivational impact this teaching technique has had on Higher Education within the Hispanic Community during the 2023-2024 period. By applying the inclusion and exclusion criteria, nine articles from the Mendeley database were analyzed. For this, the information corresponding to the analysis categories was collected, which underwent a transformation process into a relational scheme. This data management model was useful in providing the exploratory analysis process, aided by the Power BI tool, offering a thorough view through its interactive dashboard that enriched the accurate description of the impact. The results highlight how factors such as the type of motivation evidenced, the educational modality developed, and the presence or absence of technologies, among others, contributed to the improvement of elements like responsibility, active participation, the sense of flow, and other findings, along with the acquisition of transversal skills that are useful for employability today.

Keywords:

Gamification; motivation; higher education.

Gamification is a versatile strategy that has been used in different sectors including the business sector, human resources, education, among others. According to Contreras and Eguia (2016), it is defined as the use of game design elements to enhance participant engagement and motivation, aspects that prove relevant to the achievement of the established objectives.

In the field of education particularly, gamification emerges as an innovative strategy that seeks to break away from the traditional model of instruction, in which the educational setting revolves around a teacher responsible for transmitting knowledge to students, who in turn assimilate it and ultimately construct their own understanding. Through gamification, the educational setting is transformed, fostering discovery-based learning as well as the incidental comprehension of content, within a creative and engaging environment that blends the educational experience itself with play (Parra et al., 2020). It is therefore regarded as a learning tool that can be employed across different subjects with the aim of developing attitudes, collaborative behaviors, and autonomous study, as emphasized by Ortiz et al. (2018), cited in Caponetto (2014).

Motivation in education is a fundamental factor in enabling students to achieve satisfactory performance throughout their teaching-learning process, since a motivated student more effectively assimilates shared knowledge and takes responsibility for constructing their own understanding. In this regard, Pico (2017), as cited by Soledispa et al., (2020), defines motivation as the student's genuine interest in learning how to learn, in order to create their own knowledge through active, dynamic, and critical activities that foster the commitment to sustain a constant desire to learn.

Given that motivation is a determining factor in education, it becomes an aspect that educational institutions must nurture through their teaching staff, since direct contact with students allows educators to identify those who are disengaged and, consequently, at risk of failing to properly acquire knowledge a situation that may jeopardize both their academic performance and their continued enrollment at the institution. This is particularly relevant given that, according to Calatayud and Morales (2018, p. 185), "at universities this has manifested as a lack of interest in coursework, absenteeism, limited participation, and even a gradual withdrawal from studies", all of which ultimately translates into poor academic performance.

In their research, Mendel et al., (2020, p. 25) identify two types of motivation: intrinsic motivation, cited by Raffini (1998), which occurs when "a student is motivated by the simple process of learning, as well as the interest generated by the subject matter, without expecting anything in return or being compelled to do so." On the other hand, extrinsic motivation, according to the authors and cited by Campanario (2002), "arises when the stimulus bears no direct relation to the subject matter being studied, or when the sole reason for studying is the need to pass the course." It is thus understood that intrinsic motivation can foster genuine

student engagement beyond the reward obtained through interaction with game dynamics, whereas extrinsic motivation is assumed to be self-evident, as the student participates with the expectation of obtaining something in return.

This behavioral pattern in students is confirmed by Carbajal (2020), cited by Song et al., (2017) and Kiryakova et al., (2024), who recognize gamification as a powerful tool in which through play students can be driven toward commitment and motivation in learning of their own volition. Likewise, it has been noted that the integration of gamification into the teaching process has demonstrated improvements in students' mood, as well as greater participation in task completion, enhanced attitudes, and better academic performance (Zepeda et al., 2018). This makes gamification a viable strategy given the ease with which it integrates into the educational process and the promising results it can yield across any educational discipline.

Nevertheless, despite the efforts already identified in which gamification has demonstrably fostered student motivation as a teaching-learning strategy, it remains of interest to explore, from the perspective of instructional strategy design, the specific aspects that have collectively contributed to making this possible.

This exploration aims to acknowledge the efforts of Spanish-speaking researchers in designing their educational experiences, even in countries lacking adequate infrastructure or where gamification has been implemented with large student groups, while also identifying innovative data analysis tools or procedures that allow for a visual understanding of the relationship between gamification, the type of motivation exhibited, and other study variables.

It is for this reason that the objectives driving this research seek to identify the motivational impact of gamification on higher education students through a review of peer-reviewed articles published between 2023 and 2024 in Spanish, from the students' perspective, alongside the need to employ data analysis procedures or tools that allow for an accurate identification of results regarding the motivational impact of gamification. Accordingly, the following research questions are addressed: What has been the motivational impact of gamification on Spanish-speaking higher education students from 2023 to 2024? What data analysis procedure or tool can be employed for the accurate identification of results regarding the motivational impact of gamification on Spanish-speaking higher education students from 2023 to 2024?

The answers to the research questions that give rise to this study allow for the analysis of the categories that comprise the review, and contribute to building a comprehensive overview of the efforts made by higher education institutions in implementing gamification, including the instructional modality in which it was carried out. That is, whether face to face, virtual or hybrid, the type of motivation observed, whether intrinsic or extrinsic, the subjects in which it has been implemented; the tools used to carry it out; and other findings related to gamification that emerged during the implementation of the strategy, as well as

the motivational outcomes it has yielded for students in Spanish-speaking higher education during the period in question.

Another aspect to highlight with this exploration is to apply a novel data analysis procedure or tool capable of providing a visual and compact resource of the results in order to understand the relationship of the types of motivation achieved with gamification with respect to the rest of the categories of analysis, findings that, within of this research, reflect in itself the motivational impact of gamification.

METHOD

A literature review was conducted following a quantitative positivist paradigm, under a descriptive, non-experimental, cross-sectional approach, aimed at addressing the research questions outlined in the previous section. To this end, the search criteria were defined through the identification of keywords, as well as inclusion and exclusion criteria, which are described below.

Search strategy

The Mendeley search engine, owned by Elsevier Global, was selected as the research repository, with the aim of analyzing the design of instructional strategies developed through the use of gamification and evaluated among higher education students.

To this end, the identifies studies were examined with regard to the perspective of the positivist or interpretative approach under which they were conducted, that is, whether such works were grounded in students' perceptions of the gamified experience or in experimental evidence, in which instruments were employed to capture students' appraisals and in which motivation was highlighted as one of the primary outcomes during the development of the activity, thereby recognizing recurring methodological processes.

The choice of this research engine is grounded in the fact that Mendeley has a database built on the active participation of its users (approximately 10 million users and researchers) meaning that the publications available on the platform are those that have been validated by its community. Search results are delivered through criteria of scientific popularity, such as the number of citations obtained or readings performed on the articles, thereby generating search algorithms based on the frequency of use of a given study. Mendeley is also regarded as a social network for researchers in the academic sphere, enabling feedback and visibility, and thus consolidating the reputation of researchers (Arévalo, 2021).

Therefore, the keywords employed in the initial selection process of related works were: *gamification, motivation,* and *higher education*, followed by the formulation of the Boolean search expression: *gamification AND motivation AND higher education.*

Inclusion criteria

Based on the results obtained in the database, the election was filtered taking into account the following criteria:

- Articles were required to be scientific in nature, ensuring they had undergone a peer review process in which results were verified by a double- or triple-blind committee.
- The publication period of the articles had to fall within the range of 2023 to 2024, as these represent the most recent findings on the subject and help complement the systematic reviews already identified, such as those referenced by González (2023), Morocho et al. (2023), and López et al. (2023).
- The selection considered exclusively contributions in the Spanish language, which collaborate in the analysis of trends and contributions from the Spanish-speaking community, with the purpose of highlighting their participation in recent years and identifying challenges and recommendations.
- The article was situated in the context of higher education across any field of study or subject, which allowed for an enriched discussion from the perspective of different disciplines and the strategies employed within them.
- The scientific article was required to be available in full, meaning complete access was necessary for its thorough review, given that it was essential to examine in detail the gamification-based strategy or educational experience designed, taking into account the definition of the categories of analysis.
- The established categories of analysis allowed for the identification of relevant aspects pertaining to the gamified strategy employed in the selected studies, which are outlined below.

    - **Country in which the experience took place**: refers to the place of origin where the educational experience was conducted, in order to identify trends in its use across publications.
    - **Education modality**: refers to the learning environment in which the strategy was implemented, that is, whether it was carried out in a virtual learning environment, a face-to-face setting, or a hybrid modality, and thereby identify particularities or commonalities among the different teaching modalities.
    - **Type of motivation achieved or emphasized in the study**: allows for verification of whether the proposed strategy emphasized, through its implementation, the acquisition of intrinsic motivation, extrinsic motivation, or both.
    - **Type of study**: aimed at identifying the applied research approach, which allowed for the recognition of recurring patterns and methodological styles in the proposals (qualitative, quantitative,

or mixed), with the objective of identifying the mechanisms most frequently chosen by authors to demonstrate the acquisition or increase of motivation among students.

- **Nature of the population**: refers to the characteristics of the students as the subject of study, such as population size, gender distribution, academic semester, and relevant contextual aspects that helped infer contributions associated with the strategy employed.
- **Subjects used as case studies**: corresponds to specifying the name of the course or subject that was the focus of the study within the student's professional training.
- **Technological tools employed to support gamification**: where mentioned, the names of the digital applications integrated into the gamified experience were identified, with the aim of highlighting those of greatest recurrence.
- **Other non-technological strategies integrated into gamification**: in cases where the design of the gamified experience included the integration of other active methodologies aimed at achieving motivation, these would be specified in this category.
- **Additional findings discovered by the authors during the gamified experience**: refers to viewpoints noted by the authors or students that stood out during the analysis of the results and that complement the validation of the increase or achievement of motivation among the students themselves, as well as future improvements and challenges to be considered.

Exclusion criteria

In addition to the screening process that guided the acceptance of articles, a further selection level was incorporated, taking into account additional grounds for discarding any previously identified publication, based on determining whether it adhered to the following criteria:

- The articles offered a perspective from the teacher's point of view, in which the study surveyed educators regarding the effectiveness of the educational experience based on their impressions of student performance. This was considered redundant given that, due to a lack of consistency, the teacher would simultaneously act as both judge and participant in the verification of said educational experience.
- The article was developed as a systematic review, given that the intention of the subject of study was to substantiate the categories of analysis through the description of the gamification strategy employed, merely describing it was insufficient. This established a rich and well-considered discussion

form the perspectives of the different authors, one that could even yield unforeseen findings related to the subject of study in question.
- The article raised concerns regarding its methodological process, either because it did not explain the instrument employed, failed to reference the data analysis mechanism, or made assertions that could not be substantiated by the data obtained in the research.
- The article omitted the achievement of motivation from its methodological process.

Upon conducting the search using the operators and keywords described above, a total of 22 candidate articles were retrieved. Once the inclusion criteria were applied, 19 studies remained, to which the exclusion criteria were subsequently applied through the corresponding filters, yielding a final total of 9 articles for thorough review and analysis.

RESULTS

The results of the analysis of the 9 selected articles are described in greater detail in Table 1. Based on this completed table, an exploratory analysis of the results was carried out using the Power BI tool.

Table 1

Summary of analysis categories derived from the selected articles after applying the inclusion and exclusion criteria

Id	Artículo (cita)	País	Modalidad de educación (virtual, presencia. híbrida)	Tipo de motivación (intrínseca o extrínseca)	Tipo de investigación (cuali, cuanti, mixta,etc)	Naturaleza de la población	Asignatura empleada como caso de estudio	Herramientas tecnológicas que emplean	Otras estrategias no tecnológicas empleadas	Hallazgos adicionales dentro de la experiencia gamificada
1	Vides, J., Alvarez-Diaz, K. (2023).	España	presencial	Extrínseca	Mixta	12 estudiantes que fueron los que asistieron a clase (3 mujeres y 9 hombres), entre 21 y 30 años, de 4º de Grado en Economía.	Economía de la Universidad Complutense de Madrid		Metodología activa: Escape room para convertirse en el Presidente del Banco Central Europeo. Materiales: Salón, boligrafos y papel. (Aprendizaje basada en juegos).	Mejoró la atención sobre las indicaciones de la actividad. La consideraron una estrategia dinámica. Por la alta competitividad, algunos estudiantes no disfrutaron del juego. Generó estrés por el conteo regresivo del tiempo indicado para la actividad. Mejoró la comprensión respecto a los contenidos de la asignatura. Autonomía en el aprendizaje. Motivación de los estudiantes.
2	Medel-San E., Y. Lisset, Moreno, B. R., & Aguirre, C., E. (2023).	México	Virtual	Intrínseca y Extrínseca	Cuantitativa	12 estudiantes	Algoritmos y Estructuras de Datos (tercer semestre) en la carrera de Ingeniería en Telecomunicaciones y Redes		Dinámica de progresión y logros a través de mecánicas como recompensas, que brindan beneficios dependiendo los logros; desafíos, para las tareas que implicaban un reto; y competición y clasificación, que hace que los estudiantes se esfuercen por verse en los primeros lugares. En cuanto a los componentes, se implementaron las insignias, puntos, desbloqueos, tablas de posición y barras de progreso. (Aprendizaje basado en juegos)	Motivación de los estudiantes. Mejora en el interés por la materia.

3	López L. H., Félix G. J., Castro S. F., Álvarez R. J., Lizárraga C. L. (2023).	México	Presencial	Extrínseca	Mixto	No especifica	Estudiantes de la Facultad de Informática Mazatlán	No especifica	No especifica	Mayor participación y compromiso en las actividades académicas. Mayor retención y comprensión de información académica. Mejora en el rendimiento académico. Mejora de la motivación.
4	Ramos, J. Mora, M. Andrade, E. Zapata, N. (2024).	Ecuador	Virtual	Extrínseca	Cualitativo de alcance correlacional	54 estudiantes	Estudiantes de primer semestre de la carrera de Tecnología Superior en Electricidad en asignaturas básicas como Matemática Técnica, Física, Electrotecnia, Comunicación Oral y Escrita, Informática y Realidad Nacional	Quizizz, Cerebriti y Trivinet	No especifica	Incremento en el interés de la asignatura. Retener y mejorar la información recibida.
5	Álvarez-Alonso, P., & Echevarría-Bonet, C. (2023).	España	Híbrida	Intrínseca y extrínseca.	Marco positivista a través de una investigación experimental contemplando a un grupo de control (ING-B y otro de prueba (ING-A) con modelo gamificado.	Fueron 2 cursos (2019-2020 y 2020-2021) con un total de 71 (46) y 58 (23) alumnos, siendo varones el 70% del grupo ING-A y el 60% del grupo ING-B, de edades entre 18 y 20 años con un nivel de competencia digital medio-alto.	Ondas y electromagnetismo	Moodle Actividades individuales: (Office 365, Perusall, power point. Actividades grupales: Kahoot, Flippity.	Complementaron la gamificación con Aprendizaje basado en proyectos a través de empresa ficticia.	Participación activa, compromiso, aprendizaje, colaboración, motivación.
6	Rodriguez Barboza, J. R., Ávila Sánchez, G. A., Sánchez Aguirre, F. de M., Andrade Díaz, E. M., Méndez Ilizarbe, G. S., Huamaní, R. P., & La Rosa Gallardo, L. A. (2023).	Perú	Presencial	Intrínseca	Enfoque cuantitativo con diseño correlacional causal, diseño descriptivo no experimental transaccional, positivista.se evaluaron mediante cuestionario 2 variables: la competencia discursiva y la competencia funcional. La técnica de análisis es diagrama de bosque.	Una muestra de 90 participantes seleccionados mediante muestreo no probabilístico por conveniencia. Se empleó cuestionario con 25 items para evaluar la herramienta quizziz y una rúbrica con 20 items para recopilar datos sobre la competencia gramatical	Competencia gramatical en el idioma inglés	Quizziz	No especifica	Desempeño académico, colaboración, motivación, participación, retroalimentación constante.

7	Pérez-López, I. J., Navarro-Mateos, C., & Mora-González, J. (2023).	España	Presencial	Intrínseca	Paradigma interpretativo Metodología cualitativa, con el objetivo de conocer las percepciones del alumnado, a través de una pregunta abierta en Google Drive categorizando las percepciones en 4 categorías principales: gestión emocional, flow, coherencia narrativa, y aprendizaje.	La muestra del grupo en el que se desarrolló estaba formada por 51 estudiantes (36 hombres y 15 mujeres)	Fundamentos de la Educación Física,	Para el breakout de dificultad media: Genially, Phonopaper web Jigsawplanet Educaplay. Para el breakout de dificultad alta: Locke.fr. Phonopaper web Board Games Geek.	Complementaron la gamificación a través de dos breakouts (aprendizaje basado en juegos) con recursos digitales de apoyo ambientado en la saga de Harry Pottery denominado Harry Potter: el legado de Dumbledore.	Gestión emocional, aprendizaje, resolución de problemas, colaboración, adaptación a nuevas situaciones, flow, motivación.
8	López-Verdugo, I., Ridao, P., & Reina-Flores, C. (2023).	España	Presencial y virtual	intrínseca	Se combina el análisis cualitativo y cuantitativo de la información (mixto) con una metodología cuasi-experimental .	447 estudiantes de los Grados de Infantil y Primaria durante el escenario prepandemia (presencial) y durante la pandemia COVID-19 (virtual). La muestra del estudio estuvo compuesta por la totalidad de participantes en la experiencia: 447 estudiantes, 270 en la modalidad presencial y 177 en la modalidad no presencial. El 84,7% de los participantes eran mujeres y el 15,3% hombres. La franja de edad de la muestra abarcaba de los 18-22 años. La diferencia fundamental entre ambos grupos radicó en el desarrollo de la actividad en modalidad presencial para el grupo pre-COVID-19 y en modalidad síncrona online para el grupo COVID-19	La asignatura Psicología del Desarrollo del Grado en Educación Infantil y del Grado en Educación Primaria	Se utilizó la Blackboard Collaborate Ultra (Plataforma de Enseñanza Virtual).	La actividad de gamificación "¿Quién quiere ser millonario?" constituye una adaptación del famoso juego del mismo nombre con fines pedagógicos.(Aprendizaje Basado en Juego)	Colaboración, lúdico, Aprendizaje, gestión emocional, compromiso, motivación.
9	Velázquez García, L., Longar Blanco, M. del P., & Cedillo Hernández, A. (2024).	México	Presencial	intrínseca	Investigación cuantitativa con enfoque descriptivo.	125 de Estudiantes del segundo semestres del área de ingeniería, innovación y transformación. Conformados en 6 grupos durante 2 periodos académicos 2021-2022, conformado por 83 hombres y 42 mujeres en edades entre 18 y 20 años del Tec de monterrey.	Análisis de sistemas eléctricos en sistemas ingenieriles	Genially	Gamificación mediante scape room (aprendizaje basado en problemas, aprendizaje basado en juego). La actividad planeo 5 retos disciplinares que al ser resueltos entregan la llave de salida de la sala de escape	Colaboración, resolución de problemas, pensamiento crítico, aprendizaje, compromiso, motivación.

To begin the analysis of the obtained data, a relational database model was developed, as shown in Figure 1, using the data loaded in Table 1. In it, the multiplicity

relationships between the articles (the Id column within the table, referred to as article id) and each of the analysis categories (the table columns represented as attributes of the articles table and additional tables) were described, followed by the entry of data into an Excel file, in which each tab represented a distinct table of the database model, as can be observed in Table 2.

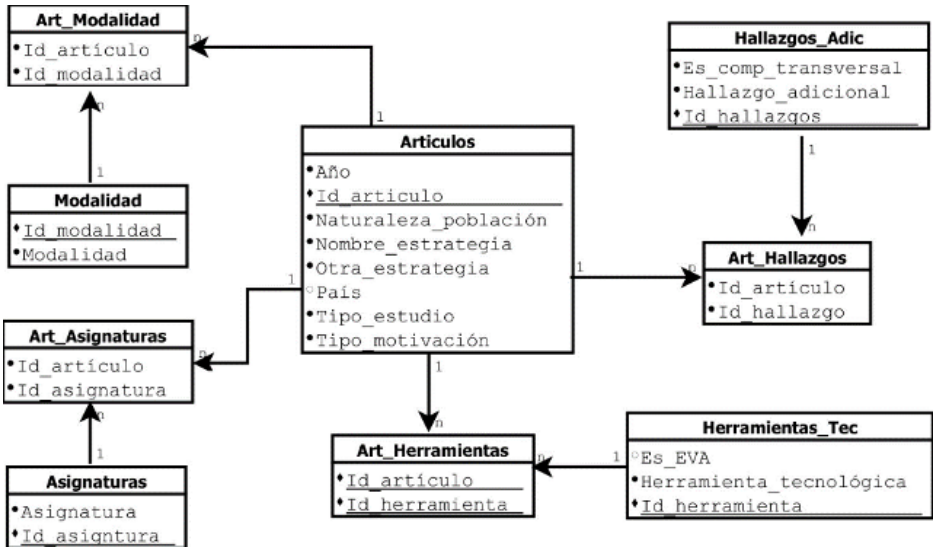
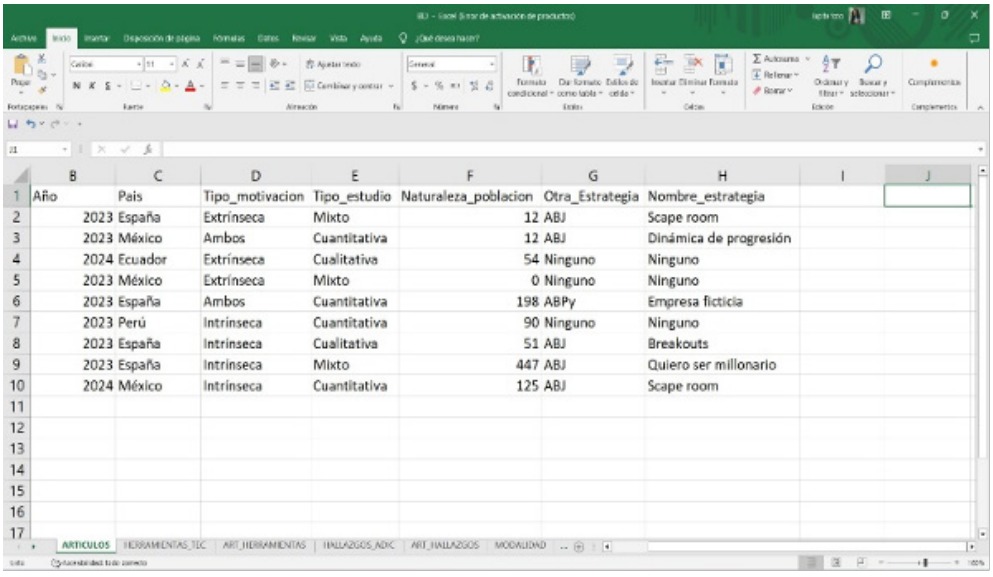


Figure 1. Relational model from Table 1

Table 2

Data from Table 1 uploaded to Excel in different sheets



	B	C	D	E	F	G	H	I	J
1	Año	Pais	Tipo_motivacion	Tipo_estudio	Naturaleza_poblacion	Otra_Estrategia	Nombre_estrategia		
2	2023	España	Extrínseca	Mixto	12	ABJ	Scape room		
3	2023	México	Ambos	Cuantitativa	12	ABJ	Dinámica de progresión		
4	2024	Ecuador	Extrínseca	Cualitativa	54	Ninguno	Ninguno		
5	2023	México	Extrínseca	Mixto	0	Ninguno	Ninguno		
6	2023	España	Ambos	Cuantitativa	198	ABPy	Empresa ficticia		
7	2023	Perú	Intrínseca	Cuantitativa	90	Ninguno	Ninguno		
8	2023	España	Intrínseca	Cualitativa	51	ABJ	Breakouts		
9	2023	España	Intrínseca	Mixto	447	ABJ	Quiero ser millonario		
10	2024	México	Intrínseca	Cuantitativa	125	ABJ	Scape room		
11									
12									
13									
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Subsequently, the Excel file was loaded into Power BI to build a dashboard that allowed all charts to be grouped into a single view, one per category of analysis, and advanced filters were applied to understands the behavior of the data based on the selection of any value within any of the categorical variables.

It was thus possible to observe the frequency of articles per category of analysis by selecting a value of interest in the histogram, which generated an effect on the frequencies of the remaining categories within the dashboard for those that met the specified filter. This allowed for the identification of, for example, how many articles reported the generation of intrinsic motivation, extrinsic motivation, or both, as well as those published in 2024, among other insights.

Through this data refinement process, an enriched discussion was established, in which the behavior of the data was described according to each categorical variables, and aspects of interest related to the motivational impact were identified, understood in this research as the effect of the remaining categories according to the type of motivation achieved (intrinsic, extrinsic, or both).

Furthermore, it enabled the exploration of certain data patterns that yielded interesting and conclusive information regarding the subject of study, supported by advanced filters and their propagation across the different categories of analysis, from which the following results were obtained:

- Among the reviewed studies in which gamification was implemented in the teaching-learning process, Spain was identified as the leading country with 44.4% of occurrences, followed by Mexico with 33.3%, while Ecuador and Peru each accounted for 11.1%, as can be observed in Figure 2.

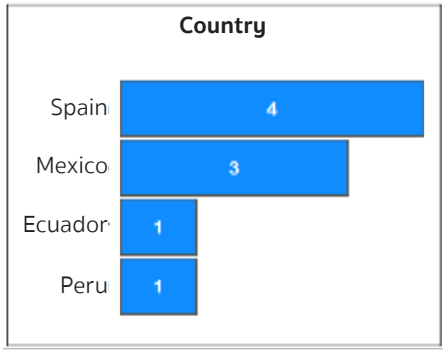

Figure 2. Frequency of items by country

- The predominant *modality* across the reviewed articles was face-to-face instruction, accounting for 55.5%, followed by the virtual modality with 22.2%, in contrast to the hybrid modality and the face-to-face/virtual modality, each representing 11.1%, as can be seen in Figure 3. It is worth noting that this last modality was distinguished from the hybrid one, as it refers to studies that replicated the same educational experience across

two different modalities in order to assess the effects and determine differences; therefore, it was not considered hybrid, given that the hybrid modality alternated between both modalities throughout the educational experience.

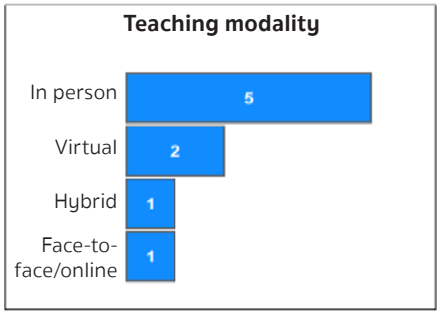

Figure 3. Frequency of articles by teaching modality

- Upon integrating gamification into the teaching-learning process, *the type of motivation* most frequently evidence was intrinsic motivation, as can be observed in Figure 4, accounting for 44.4%, while extrinsic motivation represented 33.3%, followed by 22.2% of studies that generated both types of motivation.

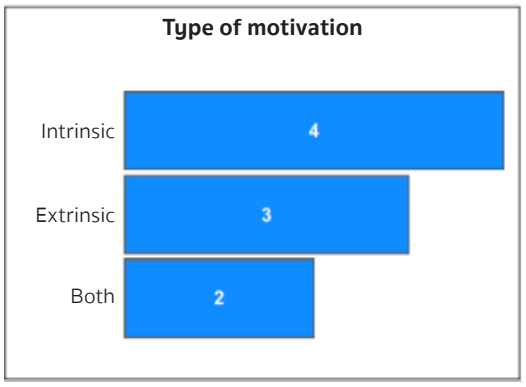

Figure 4. Article Frequency by Motivation Type

- It is noteworthy that 77.7% of the studies consulted for the development of this research were published in 2023, while 22.2% of the articles corresponded to 2024, as can be seen in Figure 5.

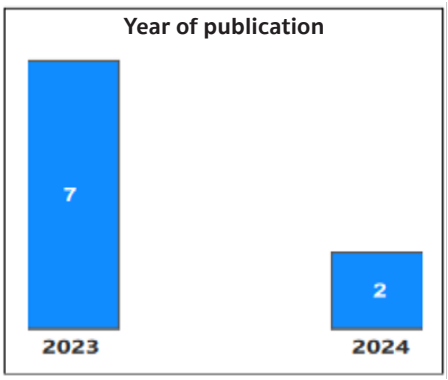

Figure 5. Frequency of articles per year of publication

- The *predominant research approach* was quantitative, accounting for 44.4%, the mixed approach was employed in 33.3% of the reviewed works, and the qualitative approach was applied in 22.2%, as can be observed in Figure 6.

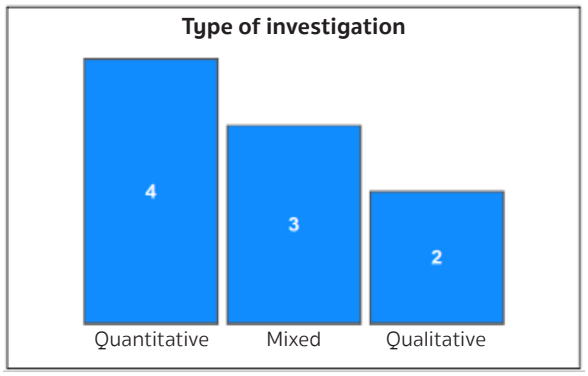

Figure 6. Article Frequency by Research Type

- Regarding the *strategies integrated with gamification*, as can be observed in Figure 7, Game-Based Learning (GBL) was mentioned in 55.5% of the studies, while 33.3% did not integrate any particular strategy into the gamified design. Finally, Project-Based Learning (PBL) predominated with 11.1%.

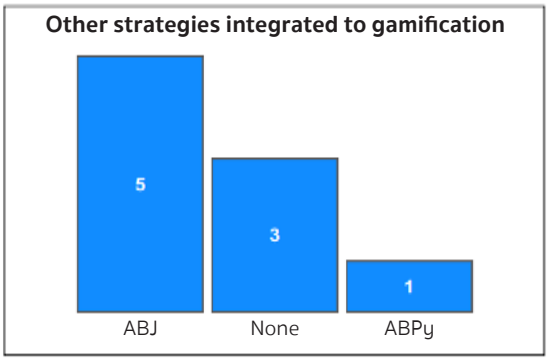

Figure 7. Frequency of articles by other strategies integrated to Gamification

- Among the *subjects* mentioned in which gamification was implemented to fulfill the objectives of the conducted studies, its application was highlighted across a wide variety of disciplines, including Computer Science, Electrical Systems, Physics, Physical Education, Oral and Written Communication, Algorithms and Data Structures, English Grammar Competence, Economics, Psychology, Electrotechnics, Mathematics, and National Reality.

- It was possible to confirm, from the students' perspective, that among the *findings identified* in the reviewed articles, 100% demonstrated a positive impact on motivation, 55.5% evidenced improvements in Learning and Collaboration, 44.4% reported improvements in Engagement, and 33.3% developed Active Participation.

  Content comprehension, Academic performance, Emotional management, Interest in the subject, Improved attention, and Problem-solving were each mentioned in 22.2% of the studies, while 11.1% reported finding such as: Adaptation to new situations, Flow, Stress generation, Ludic engagement, Critical thinking, and Constant feedback. It is noteworthy that 41.17% of these findings corresponded to the achievement of transversal competencies, as can be observed in Figure 8.

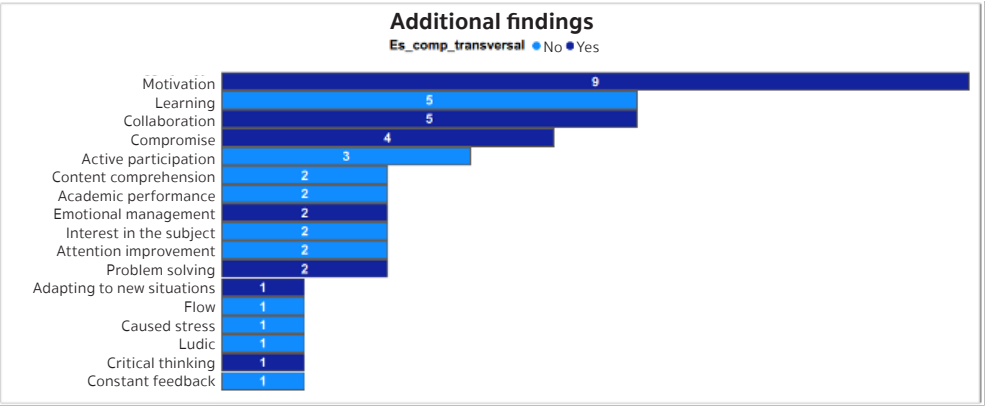

Figure 8. Frequency of articles by Additional Findings and which of them are Transversal Competencies

- Regarding the *gamified activities* employed, these were related to the objective pursued by the activity itself; 33.3% of the articles did not specify the name of the activity, while the "Scape Room" proved to be the strategy with the highest participation rate at 22.2%, followed by "Breakouts", "Progression and Achievement Dynamics", "Fictitious Company" and "Who Wants to Be a Millionaire?" each accounting for 11.1%, as can be observed in Figure 9.

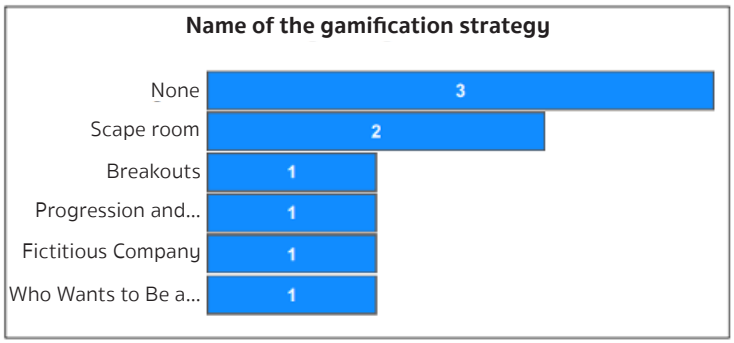

Figure 9. Frequency of articles by Name of the integrated strategy to Gamification

- The *nature of the population* proved diverse, as can be observed in Figure 10; 55% of the studies were conducted with a population of fewer than 100 students, 22.2% involved a population of more than 100 and fewer than 200 students, while 11.1% of the related works involved a population exceeding 400, a percentage shared with those studies that did not specify their population size.

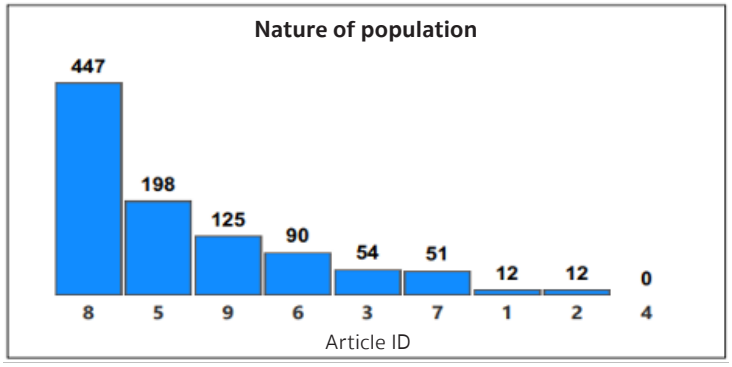

Figure 10. Frequency of articles by Nature of the population

- Finally, regarding the *technological tools* employed, 33.3% did not use any during the development of the gamified activity; of the 66.6% that did, the most frequently used were Genially and Quizizz, with Virtual Teaching/Learning Environments (VLE) accounting for 12.5%; the remaining less frequently used tools can be found in Figure 11.

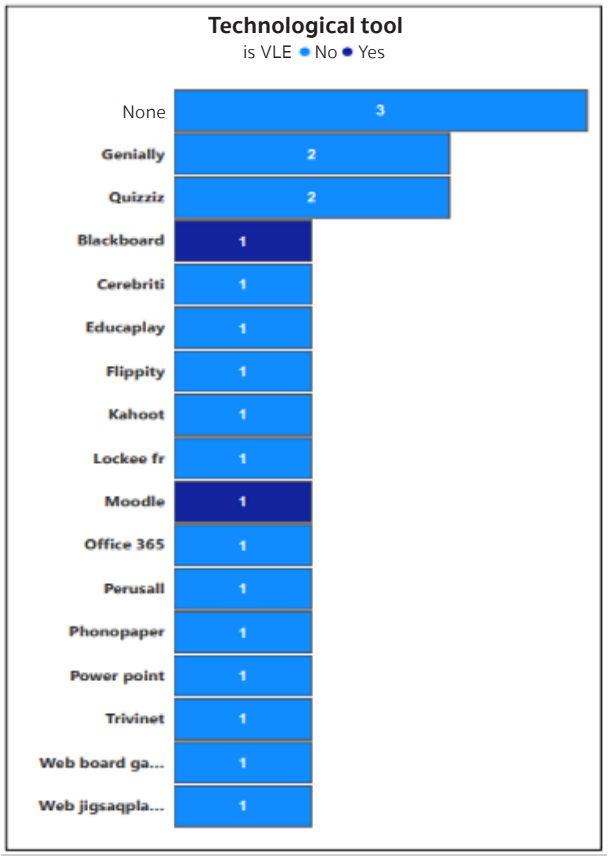

Figure 11. Frequency of articles by technological tool and which of them are Virtual Learning Environments (VLEs)

To address the research question related to the motivational impact on higher education within the Spanish-speaking community, the approach involved relating said impact to the behavior of the type of motivation evidenced (intrinsic, extrinsic, or both) with respect to the remaining categories of analysis, from which the following was obtained:

- Regarding *intrinsic motivation* achieved in relation to the remaining categories, a higher percentage was observed in publications from Spain; the predominant teaching modality was face-to-face instruction, with the majority carried out in 2023.

  Regarding the type of research in which this motivation has been evidenced, the quantitative approach stood out, with Game-Based Learning being the strategy integrates into gamification.

  The studies corresponding to intrinsic motivation have confirmed it in populations ranging from more than 50 students up to a maximum of 447, with Genially being the most frequently employed tool. As for the additional findings observed, the majority of students confirmed having acquired: Collaboration, Learning, Engagement, Emotional management, and Problem-solving skills, among others, which can be identifies in Figure 12.

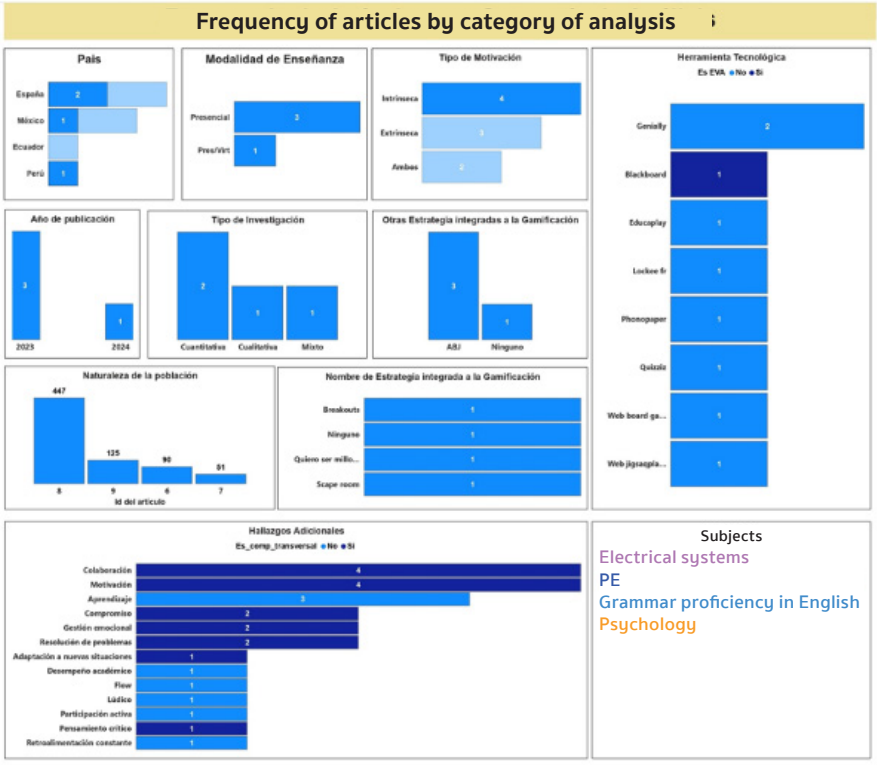

Figure 12. Intrinsic Motivation with respect to the rest of the categories

- The results evidenced from the type of extrinsic motivation in relation to the remaining categories indicated an equal proportion of studies across Spain, Mexico, and Ecuador, where the predominant teaching modality was face-to-face instruction, while the year of publication was 2023.

  The predominant research approach was mixed, without the integration of additional strategies into gamification, with only one study noted in which Game-Based Learning was employed; the nature of the population indicated that the studies were conducted with groups of 12 and 54 students, with the Scape Room also incorporated as a strategy integrated into gamification.

  Regarding the technological tools, Cerebriti, Quizizz, and Trivinet were mentioned. Finally, this type of motivation yielded additional findings such as: *Engagement, Content comprehension, Learning*, among others, which can be found in Figure 13.

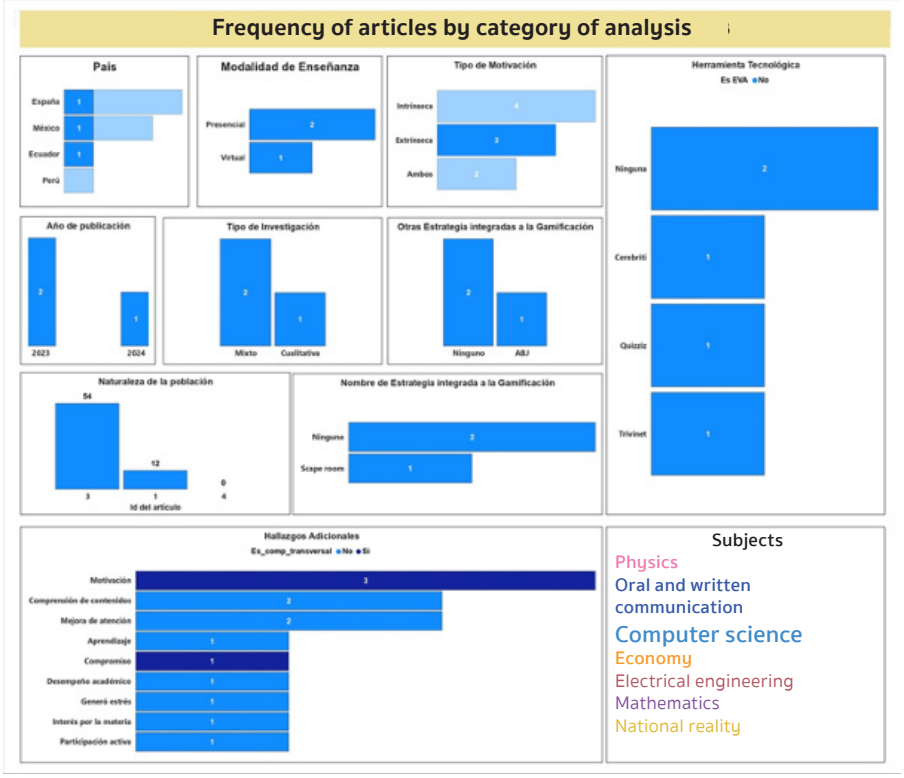

Figure 13. Extrinsic Motivation with respect to the rest of the categories

- Upon analyzing the studies in which students reported having achieved both types of motivation, Intrinsic and Extrinsic, it was observed that these were present in publications developed in Spain and Mexico in 2023, where the teaching modalities employed were face-to-face and hybrid instruction.

Regarding the type of research that evidenced both types of motivation, the quantitative approach was observed, with Game-Based Learning and Project-Based Learning being the strategies integrated into gamification.

The studies corresponding to both types of motivation were confirmed in population of 12 and 198 students, with Flippity, Kahoot, Moodle, Office 365, Perusall, and PowerPoint being the tools employed. As additional finding, the majority of students confirmed having achieved: *Learning, Collaboration, Engagement, Interest in the subject matter,* and *Active Participation*, as can be observed in Figure 14.

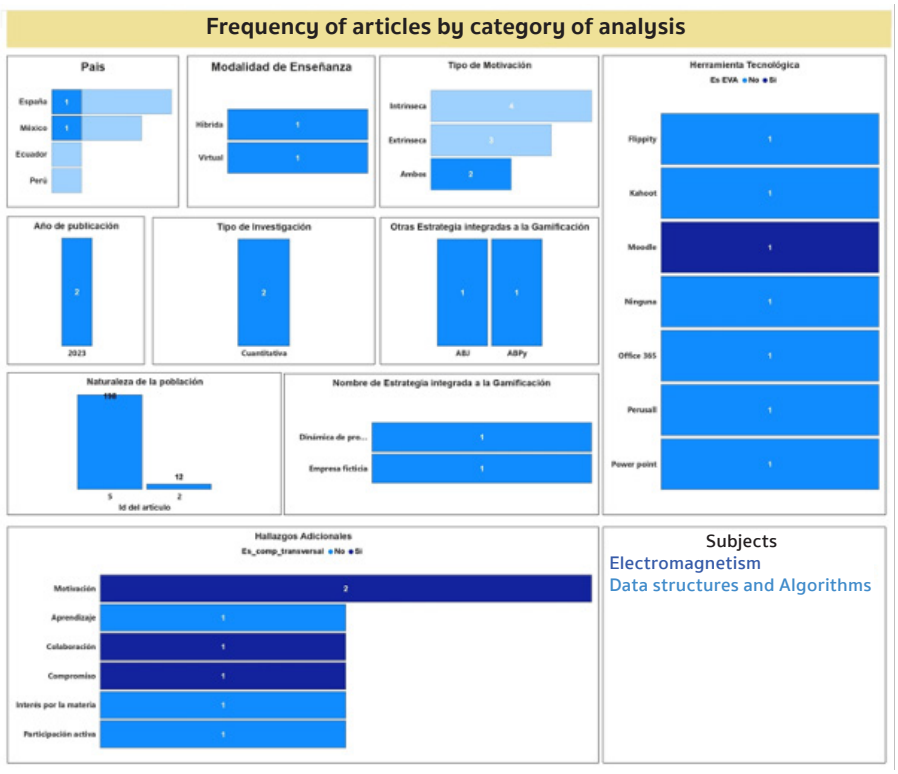

Figure 14. Intrinsic and Extrinsic Motivation with respect to the rest of the categories

Likewise, in addressing the second research question related to the procedure or tool for data analysis, a methodology was contributed for mapping the data from Table 1, drawing on foundational knowledge of databases to generate a relational model that considered the multiplicity relationships among them. Subsequently, the data were transferred into Excel and then read by the Power BI tool, from which the dashboard with the resulting histograms was constructed, employing filters that propagated across the different categories of analysis.

CONCLUSIONS

Through the appropriate definition of the inclusion and exclusion criteria, the identification and analysis of 9 research articles from the Mendeley repository was achieved, thereby allowing the following assertions to be made regarding the efforts carried out in recent years (2023-2024) by the Spanish-speaking community in employing gamification within the educational process.

Spain is the country of origin with the highest number of recent publications; the articles were most frequently published in 2023; the variation in the nature of the population ranged from 12 to 447 participants; the tools most frequently employed by the community to build gamified resources were Genially and Quizizz, corroborating what was noted by Vergara Rodríguez et al. (2019), who indicate that these tool are popular due to their ludic approach, fostering participation through the interactive and creative activities that can be developed with them.

Moreover, it was demonstrated that gamification has been applied across a diverse range of disciplines and professional profiles, thereby validating that this educational strategy can be employed in any field of professional development within higher education, which is confirmed by Ortiz et al. (2018), cited by Caponetto (2014), who regard gamification as a learning tool that can be employed across different subjects for the development of attitudes, collaborative behaviors, and autonomous study.

Furthermore, Game-Based Learning using the *Scape Room* represented the most frequently employed option as a teaching-learning tool linked to gamification, which confirms the assertions made by Piñero Charlo (2019), who notes that a strong interest has emerged in the educational sphere for developing this type of strategy, in addition to what is emphasized by Rodríguez-Oroz et al. (2019), who highlight the compatibility of gamification with other teaching strategies.

Nevertheless, gamification has identified a series of challenges and complexities in its design, according to the perspective of the participants in the related works analyzed. Among them, Vides and Alvarez-Diaz (2023) noted that during their educational experience, students reported feeling stressed when working on timed activities, which may obscure the true intention of learning through play. In addition, Álvarez-Alonso and Echeverria-Bonet (2023) highlighted the importance of taking group size into account when implementing a gamified experience, as the feedback process can be demanding and exhausting; therefore, the design of the experience must consider the effects that the frequent use of time pressure and even group size may produce.

For this reason, future work is expected to address this study by considering a search and selection of articles exclusively in English, in order to verify whether the findings remain consistent or whether new learning strategies or concepts emerge that are related to the contexts of use within communities where English is the native language.

Likewise, among the categorical variables examined to analyze the motivational impact of gamification in higher education, the following was found: the preferred teaching modality for gamification has been face-to-face instruction: the most frequently reported type of motivation was intrinsic, as supported by Lomba et al. (2021), who assert that gamification in higher education has been characterized by achieving this type of motivation; and the research approaches most frequently employed to demonstrate improvements in motivation were quantitative in nature.

Besides, the concept of flow was mentioned by the students and refers to a state of complete concentration on the activity while maintaining active participation in it (García Lázaro, 2019). This invites consideration of this variable as a relevant aspect of study when implementing gamification.

Addressing the second objective of this research, the data analysis procedure suggested alongside the Power BI tool proved useful in optimizing the time required for data preparation and descriptive analysis, as its filtering capability streamlines the counting of value occurrences and, consequently, aids in the formulation of assumptions and data-driven decision-making.

Finally, valuable finding derived from the impact of gamification was the identification, within student perceptions, of impressions expressed during the educational experience, such as: learning, active participation, content comprehension, academic performance, interest in the subject matter, improved attention, and flow; as well as aspects related to varying degrees of transversal competency or *soft skill* development, as listed by Galdeano Bienzobas and Valiente Barderas (2010), including: motivation, collaboration, engagement, emotional management, problem-solving, adaptation to new situations, and critical thinking. This demonstrates, according to Bassi, Busso, Urzua, and Vargas (2012), as cited in Gontero and Albornoz (2019), the capacity of gamification to develop in students these life skills that are in high demand in today's labor market.

This allowed for the assertion that gamification is not only an educational strategy that motivates students to generate their own knowledge, but that, with the support of the Power BI analysis tool, it was evidenced as a powerful alternative for developing the transversal competencies demanded by the global villages.

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