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ARTICLE / ARTÍCULO

Preservice Teacher Education for Generation Z: Evaluation of a Gamified Experience in Higher Education

Formación inicial del profesorado para la Generación Z: evaluación de una experiencia gamificada en Educación Superior

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Abstract: This research endeavor sought to analyze the extent to which the objectives of an implemented innovative project, stemming from collaborative efforts among university faculty, were achieved. Furthermore, it aimed to evaluate the efficacy of Kahoot! in the pedagogical development of Generation Z and to examine the influence of these perceptions on the prospective utilization of this resource in future instructional contexts. Following the administration of an electronic questionnaire to a cohort of 196 students enrolled in the Educational Research Methods course at two Spanish Universities, where instructors had employed Kahoot! with a standardized methodological framework, a significant propensity for its adoption as a future professional pedagogical tool was observed. Concomitantly, a favorable perception of the resource was evident, with respondents expressing conviction regarding the desirability of integrating Kahoot! into their future classrooms, particularly due to its capacity to enhance learning outcomes and augment audience engagement. In light of these findings, the prospective educators, constituting members of Generation Z and operating within a technologically saturated environment, posit that the integration of a technological instrument into instructional practice is contingent not upon the inherent attributes of the resource, but rather upon the pedagogical advantages accrued from its utilization within the teaching-learning process. This perspective underscores a technology utilization paradigm predicated upon pedagogical benefits rather than the intrinsic characteristics of the technology itself.

Keywords: Gamification, Kahoot!, Educational Innovation, Higher Education, Inservice Teacher Education.

Resumen: En la presente investigación se ha pretendido analizar el grado de consecución de los objetivos de un proyecto innovador llevado a cabo, que surge de la colaboración entre docentes universitarios, además de valorar el empleo de Kahoot! en la formación de la Generación Z y estudiar la influencia de dichas percepciones en la consideración del recurso para su empleo futuro en la docencia. Tras aplicar un cuestionario electrónico a una muestra de 196 estudiantes de la asignatura de Métodos de Investigación Educativa, de dos universidades españolas, cuyos docentes habían empleado Kahoot! con la misma planificación metodológica, se detecta un alto grado de predisposición para su empleo como futuros profesionales de la enseñanza, además de una percepción positiva del recurso, mostrándose convencidos de que en su futuro sería conveniente aplicar Kahoot! en sus aulas, especialmente por favorecer el aprendizaje y aumentar la participación de la audiencia. Teniendo en cuenta estos resultados, los futuros docentes, actuales miembros de la Generación Z, inmersos en el contexto tecnológico, defienden que la incorporación docente de una herramienta tecnológica no depende en sí del propio recurso, sino de los beneficios pedagógicos que genera su uso en el proceso de enseñanza-aprendizaje, lo que se traduce en un uso de la tecnología basado en los beneficios y no en el propio recurso.

Palabras clave: Gamificación, Kahoot!, Innovación educativa, Educación Superior, Formación Inicial del Profesorado.

1. Introduction

The current generation of students populating university classrooms—known as Generation Z (Schroer, 2008)—is composed of young people who are more self-sufficient, self-taught, and better prepared, due to the recent period of job insecurity, economic crisis, and intense competition they have experienced. This generation, characterized by these traits and by being the first considered true digital natives, born and raised within digital culture, feels strongly connected to the use of information and communication technologies (Pérez-Escoda et al., 2016). They are accustomed to communicating, interacting, creating and sharing content, and also searching for and finding information in real time—“without waiting, without pauses” (Espiritusanto, 2016, p. 116). For this reason, today’s students demand the implementation of dynamic tools that enhance their teaching-learning process (Avanço & Lima, 2020; Barreal et al., 2016), since the mere presence of technological resources in the classroom is insufficient to develop their digital competence (Fernández-Cruz & Fernández-Díaz, 2016).

The use of technological resources in the classroom must be tied to innovative teaching methodologies in which the teacher benefits from the use of tools to design a training process better suited to students’ interests (Hernández-Ramos et al., 2018). Therefore, the fundamental didactic key for this generation—who has grown up surrounded by new media (Álvarez et al., 2019)—lies in the technological and pedagogical competences of teachers (Fernández-Cruz & Fernández-Díaz, 2016). This is where the essential importance of using such resources in teacher education emerges, ensuring that the cycle of pedagogical updating remains unbroken and can flow into the minds of younger generations, who will grow with the imprint of lifelong learning as an educational philosophy.

Within teacher education, subjects that involve data analysis—both quantitative and qualitative—within the field of Educational Sciences have traditionally been based on problem-solving involving understanding, application, and analysis through systematic procedures. Unfortunately, the content students must face in these courses often differs significantly from the pedagogical vocation that led them to pursue degrees in Education, frequently generating demotivation, rejection, or even fear toward these subjects (Hernández-Ramos et al., 2018). Previous studies (Bicen & Kocakoyun, 2018; Douligeris et al., 2018; Martínez-Navarro, 2017; Rodríguez-Fernández, 2017; Wang, 2015; Zarzycka-Piskorz, 2016) show a positive evaluation of Kahoot! as an instructional tool in higher education, increasing motivation (Batsila & Tsihouridis, 2018; Prieto et al., 2019), student participation (Dervan, 2014), and even academic performance in some cases (Guardia et al., 2019; Iwamoto et al., 2017).

Following the development of the teaching innovation project at the University of Salamanca—Gamification at university: design, development and evaluation of the use of Kahoot! in the classroom. Student satisfaction and academic performance in Educational Research Methods courses—a collaborative network was established among university professors who shared similar concerns. Based on common didactic criteria (Hernández-Ramos et al., 2018), as an innovative strategy, they agreed to implement Kahoot! in the Educational Research Methods course with the intention of increasing student interest (I), facilitating learning of course content (II), increasing classroom participation (III), and improving academic performance (IV).

Therefore, the aim of this study is to determine and evaluate—based on the level of achievement of the innovation project's objectives and on students' perceptions regarding the benefits of Kahoot!—the use of this tool in the professional training of Generation Z students in the field of education. Additionally, to further analyze the use of this tool in teacher training, the effect of students' evaluations on their future intention to use the technological resource is examined.

1.1. Pedagogical Updating of University Faculty

The use of information and communication technologies has become one of the most promising options for improving the teaching-learning process (Agredo-Delgado et al., 2020). When incorporated into educational innovation as one of the most powerful tools available to faculty to adapt their teaching to students' profiles (Barreal et al., 2016), and when combined with the growing use of game elements and game design techniques in non-game contexts (Zarzycka-Piskorz, 2016)—which attract this generation through competition (Hanus & Fox, 2015)—they form a didactic blend that leads to higher student attendance (Del Cerro, 2015), increased motivation and engagement (Barrio et al., 2016; Wang & Lieberoth, 2016), and enhanced cognitive, emotional, and social development (Siegle, 2015). This facilitates active participation (Bicen & Kocakoyun, 2018) through meaningful technological integration (Baszuk & Heath, 2020).

The rise of technology in the classroom has provided the university system with greater versatility and adaptability to the training needs of students (Barreal et al., 2016). In recent years, there has been a strengthening of the trend toward innovation through the motivational elements of gaming scenarios, transferring them to formal, non-playful contexts (Villalustre & Del Moral, 2015). Although the use of gamification is still evolving within the university context (Barreal et al., 2016), it is increasingly attractive (Dichev & Dicheva, 2017; Vázquez-Cano, 2025). Thus, with the goal of increasing student participation and content comprehension, technology is used in the form of games in the classroom to enhance acquired content and outcomes (Baszuk & Heath, 2020).

A strong example of this gamification approach (Yapıcı & Karakoyun, 2017) is the educational tool Kahoot! (Resmayani & Putra, 2020). Numerous studies in higher education (Baszuk & Heath, 2020; Belmonte & Hernández-Ramos, 2023; Bicen & Kocakoyun, 2018; Guimares, 2015; Hernández-Ramos & Belmonte, 2020; Holbrey, 2020; Ismail & Mohammad, 2017; Licorish et al., 2018; Maesaroh et al., 2020; Solanki et al., 2020; Wang & Tahir, 2020; Zarzycka, 2014) show that it enables an active review of learning while revealing potential learning gaps to instructors (Dellos, 2015; Baszuk & Heath, 2020). One of its key features is its ability to spark curiosity and participation among digital natives, positively impacting learning performance (Gazotti-Vallim et al., 2017). This application promotes enjoyment and competitiveness, motivating students and fostering group reciprocity, learning, and discussion (Del Cerro, 2015; Solanki et al., 2020).

Within the field of Methods of Research and Diagnosis in Education, instructors are aware that the courses they teach are not necessarily among the most appealing to students. This perception drives teachers to motivate students through innovative methodologies that incorporate technological resources effectively. In this search for interactive strategies that promote interest, motivation, and student participation, the

pedagogical possibilities of smartphone use in the classroom have been recognized (Douligeris et al., 2018; Rodríguez-Fernández, 2017).

Kahoot! offers teachers and students a teaching-learning process based on active gamification methodologies, grounded in digital resources designed to improve student engagement (Licorish et al., 2018) and provide both extrinsic and intrinsic motivation (Silva et al., 2018). It promotes the execution of pedagogical activities through meaningful and entertaining experiences (Torres-Toukoumidis et al., 2018).

This interactive technological tool, based on contemporary student-centered and behavior-oriented design methodologies (Plump & La Rosa, 2017), which incorporates elements used in game design, is intended to provide engaging learning experiences (Gazotti-Vallim et al., 2017) in order to involve and engage students in complex dynamics and predispose them favorably toward learning acquisition (Villalustre & Del Moral, 2015). It not only provides them with a fun and appealing didactic environment through the incorporation of playful elements (Zarzycka-Piskorz, 2016), but also challenges them throughout the learning process (Dellos, 2015), thereby improving the overall educational experience offered (Holbrey, 2020).

For all these reasons, the present study aimed to analyze the degree to which the objectives of the implemented teaching innovation were achieved, in addition to assessing the use of Kahoot! in the training of Generation Z students and examining the influence of these perceptions on the consideration of this resource for future use in teaching.

2. Method

The study presented in this article was conducted from a quantitative research perspective employing a non-experimental design, in which none of the study variables were manipulated (Hernández-Sampieri, 2014).

2.1. Participants

The study participants, selected through non-probability convenience sampling (Otzen & Manterola, 2017), were the 196 students enrolled in the Educational Research Methods course (a first-year subject in the degrees of Pedagogy and Primary and Early Childhood Education) at the University of Murcia and the University of Salamanca, who agreed to complete the electronic questionnaire once the course had concluded. Faculty from both universities worked jointly and cooperatively toward updating the course content and enhancing its dynamism. Both followed the same didactic guidelines for the use of Kahoot! in the classroom, and no significant differences were found in students' evaluations based on their university affiliation.

All participants in the sample can be considered members of Generation Z, as they were born around the year 2000.

2.2. Data Collection Instrument

The instrument used to collect information was an electronic questionnaire consisting of 15 Likert-type items with five response options: strongly disagree (1); disagree (2);

neither agree nor disagree (3); agree (4); and strongly agree (5). The first ten items, drawn from previous research (Martínez-Abad & Hernández Ramos, 2017), focus on evaluating the use of Kahoot!, while the following four measure the degree to which the four objectives of the teaching innovation were achieved: increasing interest, facilitating content learning, promoting classroom participation, and improving academic performance. The final item captures students' intention to use Kahoot! in their future professional practice as teachers. To assess the reliability of the instrument, Cronbach's alpha coefficient was calculated, yielding a very good value (Prieto & Delgado, 2010) for the entire questionnaire ($\alpha = .946$; $n = 15$) and for the Kahoot! evaluation scale ($\alpha = .931$; $n = 10$).

2.3. Data Analysis Techniques

For data analysis, both descriptive statistics and non-parametric inferential statistics were employed, once it had been verified that the conditions established by Siegel (1990) were not met, based on the results of the normality analysis (Kolmogorov–Smirnov test), the presence of a sample size greater than 30 individuals, and the confirmation of equal variances or homoscedasticity (as indicated by Levene's test).

To determine possible correlations between positive perceptions of Kahoot! and a greater intention to use it in future teaching practice, Spearman's rho (ρ) coefficient was calculated.

The research process followed a systematic and rigorous procedure of data classification and analysis using the IBM SPSS Statistics 23 software package.

3. Results

Based on the different objectives established in the study, the results are presented in three major sections: the degree to which the objectives of the teaching innovation were achieved, students' evaluation of the use of Kahoot! in the training of Generation Z, and the analysis of how these perceptions influence the consideration of the resource for future use in teaching.

3.1. Evaluation of the Teaching Innovation

A teaching innovation is considered positive when the novelty introduced by instructors leads to an improvement in the teaching-learning process and responds to the needs that motivated its implementation. As previously discussed, the instructors, after a process of reflection and inter-university collaboration, used Kahoot! with clear and precise objectives.

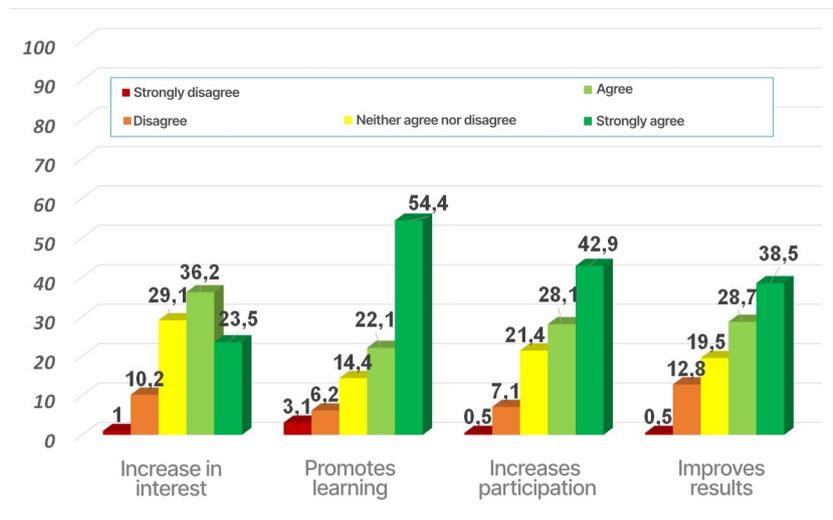


Figure 1. Evaluation of the teaching innovation.

To assess the achievement of these objectives, students’ own perceptions were taken into account. Figure 1 shows the degree of agreement among students regarding the level of attainment of the teaching innovation objectives:

- The first objective focused on analyzing students’ interest in a subject that, a priori, is often considered unattractive. The results show that 59.7% of students stated that their interest in the subject had increased, with 23.5% being fully convinced of this. Likewise, 29.1% expressed a neutral attitude toward the issue, and 11.2% considered that their interest had not increased.
- Regarding the second objective, the highest ratings were obtained: 76.5% of students believed that the use of Kahoot! enhances the learning process, with more than half of them (54.4%) convinced of this.
- Although the scores were not as high as in the previous objective, positive results were observed when evaluating the influence of Kahoot! on student participation in class. A total of 71% of students stated that Kahoot! promotes classroom participation, with 42.9% being fully convinced of this. On the opposite side, 7.6% were not convinced of this benefit and 21.4% expressed neutrality.
- Since students provided their responses after the evaluation process, it was also possible to assess the extent to which Kahoot! contributed to improving academic performance. As in the previous objectives, positive results were maintained, with 67.2% of students reporting favorable evaluations, 19.5% expressing neutrality, and 13.3% expressing some degree of disagreement.

Overall, based on the trend in evaluations of the degree to which the teaching innovation objectives were achieved—70% favorable, 20% neutral, and 10% negative—it can be concluded that the use of Kahoot! in the Educational Research Methods course improves students’ training process.

3.2. Evaluation of Kahoot! Use

Next, the second block of results presents students' perceptions of Kahoot!. As shown in Table 1, students expressed an overall favorable opinion regarding the didactic use of the tool.

Table 1. Evaluation of Kahoot! use

Kahoot! has helped me...	Media	SD	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	N
in the elaboration of personal syntheses of the content.	3,63	,932	,5	12,2	28,6	40,8	17,9	196
to generalize theoretical content to real situations.	3,68	,951	1,0	9,7	30,6	37,2	21,4	196
to solve practical problems.	3,65	,935	1,0	11,2	27,0	42,9	17,9	196
to understand the basic concepts and ideas of the subject.	3,60	1,069	1,5	16,8	25,0	33,2	23,5	196
in the analysis and reflection on the content studied.	4,13	,896	1,0	3,6	17,3	37,2	40,8	196
to memorize the content of the subject.	3,89	1,010	1,0	11,7	15,3	40,8	31,1	196
to express personal evaluations about the topics addressed.	3,74	1,016	2,0	8,7	29,1	33,2	27,0	196
to self-assess my learning in the subject.	3,50	1,010	3,1	11,7	34,7	33,2	17,3	196
to organize my study of the subject.	4,17	,931	0,5	6,2	14,4	33,3	45,6	195
in the elaboration of personal syntheses of the content.	3,42	1,076	2,0	19,4	32,7	26,0	19,9	196

Delving deeper into the evaluations provided by the students, a positive—though moderate—perception of Kahoot! becomes evident, with the rating 4 (agree) being the most common across most items. A higher appreciation is observed in items 5 [Kahoot! has helped me understand the basic concepts and ideas of the subject] and 9 [Kahoot! has helped me self-assess my learning in the subject], where “strongly agree” is the most frequently selected response, with acceptance rates of 78% and 88.9%, respectively.

Conversely, although the overall evaluation can be considered positive, it is noteworthy that in items 8 [Kahoot! has helped me express personal evaluations about the topics addressed] and 10 [Kahoot! has helped me organize my study of the subject], the majority of students reported feeling neutral regarding these pedagogical effects of using Kahoot! in teaching.

3.3. Factors Influencing the Future Intention to Use Kahoot!

The final item of the questionnaire [In the future, I would like to use Kahoot! as a teacher] was included with the aim of determining students' intentions—as future education professionals and members of Generation Z—to use Kahoot! in the instructional activities they will conduct. The degree of agreement expressed is shown in Figure 2, where it can be observed that 75.5% of students are in favor of using Kahoot! in their future professional practice, and more than half of the students (55.6%) are fully convinced of this.

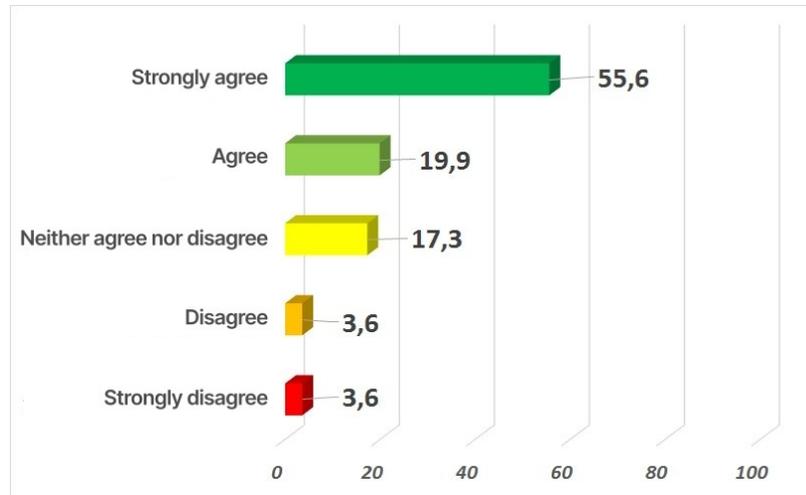


Figure 2. Intention to use Kahoot!

Taking into account the previously obtained results—both regarding the evaluation of the teaching innovation and the tool itself—the high intention to use Kahoot! is an expected outcome. However, to further explore this aspect, Spearman’s correlation coefficient was calculated between the intention to use the tool and the evaluations given in the earlier sections.

The results shown in Table 2 indicate, as anticipated, a direct relationship among the different variables. The relevance of these values lies in the intensity of these relationships: the variables related to enhancing learning and increasing participation are those that correlate most strongly with the intention to use the tool. The evaluation of the resource itself—the instrumental aspect—is the one that shows the weakest relationship with the intention to use it.

Table 2. Relationship between evaluations and intention to use.

Increase in interest	$\rho = .558$
Enhances learning	$\rho = .697$
Increases participation	$\rho = .637$
Improves academic performance	$\rho = .528$
Evaluation of Kahoot!	$\rho = .450$

Taking the results obtained into account, it is evident that, for members of Generation Z—accustomed to the presence of technology in all areas of their lives—the use of a technological resource in teaching does not depend on the resource itself, but rather on the benefits that its use generates in the teaching–learning process.

4. Conclusions

Teaching competence in information and communication technologies continues to be a crucial element for educational development (Fernández-Cruz & Fernández-Díaz, 2016). Although the implementation of gamification in higher education is still at an

early stage (Barreal et al., 2016; Belmonte & Hernández-Ramos, 2023; Hernández-Ramos & Belmonte, 2020), interactive activities using applications such as Kahoot! (Baszuk & Heath, 2020; Bicen & Kocakoyun, 2018; Guimares, 2015; Holbrey, 2020; Ismail & Mohammad, 2017; Licorish et al., 2018; Maesaroh et al., 2020; Solanki et al., 2020; Wang & Tahir, 2020; Zarzycka, 2014) positively influence student behavior, based on experiences and feelings constructed through gameplay (Rodríguez-Fernández, 2017). They affect motivation and engagement, producing pedagogical benefits that facilitate learning.

Studies examining the use of this tool (Dellos, 2015; Plump & La Rosa, 2017) have shown that it is simple and intuitive to use, and that it benefits both teachers and students. The different prior studies supporting this research (Batsila & Tsihouridis, 2018; Bicen & Kocakoyun, 2018; Douligeris et al., 2018; Iwamoto et al., 2017; Lin et al., 2018; Zarzycka-Piskorz, 2016) demonstrate a positive evaluation from both groups regarding the use of gamification in higher education in general, and of the Kahoot! tool in particular.

The results of this innovative project—arising from collaboration among university instructors and carried out in the context of a subject that is traditionally not appealing to students, such as the Educational Research Methods course—show, in line with other studies (Hernández-Ramos et al., 2018; Villalustre & Del Moral, 2015), that it improves students' training process.

Most students reported an increased interest in the subject when exposed to gamified methodology (Batsila & Tsihouridis, 2018; Prieto et al., 2019), stating that the use of Kahoot! enhances the learning process (Villalustre & Del Moral, 2015). Likewise, this study found positive results regarding the didactic influence of the tool on student interaction and participation in the classroom (Licorish et al., 2018; Silva et al., 2018), thereby improving the overall educational experience (Holbrey, 2020).

Therefore, consistent with several studies (Bicen & Kocakoyun, 2018; Iwamoto et al., 2017; Lin et al., 2018), although in contrast with others (Tobias et al., 2013), it is concluded that Kahoot!, despite being a game designed for educational purposes, is as fun and entertaining as those designed purely for recreational purposes. In this sense, students express a favorable opinion regarding the pedagogical use of the tool, asserting that it has helped them better understand the course concepts and self-assess their learning (Dellos, 2015; Baszuk & Heath, 2020).

Given that the effectiveness of implementing gamified dynamics—and, more specifically, of using Kahoot!—depends on the quality and composition of the questions used (Lucke, Keyssner, & Dunn, 2013), it is essential to pay attention to teachers' pedagogical updating (Fernández-Cruz & Fernández-Díaz, 2016). The results obtained required a process of pedagogical renewal and updating, as well as creative effort, in the design of engaging learning scenarios, adopting game-like mechanisms to energize the learning process, combining innovative teaching strategies, and using digital tools to facilitate communication and participation, as well as to promote competitiveness through engaging activities capable of fostering the development of numerous competencies (Villalustre & Del Moral, 2015).

Considering that the subject addressed in this research is part of undergraduate degrees in the field of Educational Sciences, the educational and exemplary potential

of simply integrating technologies appropriately into teaching methodology is highly valued (Hernández-Ramos et al., 2018). Instruction is being provided to future teachers, which entails a personal responsibility to serve as an example and inspiration for their future professional practice. Students are convinced that, in their future teaching careers, it would be advisable to incorporate Kahoot! in the classroom, particularly because it enhances learning and increases audience participation.

Taking these results into account, it becomes clear that for members of Generation Z—accustomed to the presence of technology in every aspect of their lives—the incorporation of a technological resource into teaching does not depend on the resource itself, but on the benefits generated by its use in the teaching–learning process. When evaluating the suitability of a tool, they are more influenced by the positive effects on learning than by the tool’s utility itself, thus fostering a technology use approach based on pedagogical benefits rather than on the resource per se.

5. References

- Agredo-Delgado, V., Ruiz-Melenje, P. H., Collazos, C. A., Moreira, F., & Fardoune, H. M. (2020). Methodological Guidelines Catalog to Support the Collaborative Learning Process. *Education in the Knowledge Society, 21*, 1-16. <https://doi.org/10.14201/eks.22204>
- Álvarez, E., Heredia, H., & Romero, M. F. (2019). La Generación Z y las Redes Sociales. Una visión desde los adolescentes en España. *Revista Espacios, 40*(20), 9-22. <http://www.revistaespacios.com/a19v40n20/a19v40n20p09.pdf>
- Avanço, L. D., & Lima, J. M. D. (2020). Diversidade de discursos sobre jogo e educação: delineamento de um quadro contemporâneo de tendências. *Educação e Pesquisa, 46*, 1-17. <http://dx.doi.org/10.1590/S1678-4634202046215597>
- Belmonte, M. L., & Hernández-Ramos, J. P. (2023). Influencia del género en la valoración de la herramienta de gamificación Kahoot!. *Revista Conhecimento Online, 2*, 289-307. <https://doi.org/10.25112/rco.v2.3305>
- Barreal, J., Hernández, A., & Jannes, G. (2016). La gamificación como herramienta didáctica aplicada a métodos estadísticos en el proceso de aprendizaje de las enseñanzas turísticas. *Learning, 488-493*. <https://aecit.org/files/congress/20/papers/360.pdf>
- Barrio, C. M., Muñoz-Organero, M., & Soriano, J. S. (2016). Can gamification improve the benefits of student response systems in learning? An experimental study. *IEEE Transactions on Emerging Topics in Computing, 4*(3), 429-438. <https://doi.org/10.1109/TETC.2015.2497459>
- Baszuk, P. A., & Heath, M. L. (2020). Using Kahoot!! to increase exam scores and engagement. *Journal of Education for Business, 1-5*. <https://doi.org/10.1080/08832323.2019.1707752>
- Batsila, M., & Tsihouridis, C. (2018). "Let's Go... Kahoot!ing" - Teachers' Views on C.R.S. for Teaching Purposes. *Advances in Intelligent Systems and Computing, 715*, 563-571. https://doi.org/10.1007/978-3-319-73210-7_66
- Bicen, H., & Kocakoyun, S. (2018). Perceptions of students for gamification approach: Kahoot! as a case study. *International Journal of Emerging Technologies in Learning, 13*(2), 72-93. <https://doi.org/10.3991/ijet.v13i02.7467>
- Del Cerro, G. M. (2015). Aprender jugando, resolviendo: diseñando experiencias positivas de aprendizaje. XII Jornadas Internacionales de Innovación Universitaria Educar para transformar: Aprendizaje experiencial. <https://goo.gl/x6Z70t>
- Dellos, R. (2015). Kahoot!! A digital game resource for learning. *International Journal of Instructional Technology and Distance Learning, 12*(4), 49-52.

- Dervan, P. (2014). Increasing in-class student engagement using Socrative (an online Student Response System). *All Ireland Journal of Higher Education*, 8(3). <https://ojs.aishe.org/index.php/aishe-j/article/view/180>
- Dichev, C., & Dicheva, D. (2017). Gamifying education: What is known, what is believed and what remains uncertain: A critical review. *International Journal of Educational Technology in Higher Education*, 14(9), 1-36. <https://doi.org/10.1186/s41239-017-0042-5>
- Douligeris, C., Seralidou, E., & Gkotsiopoulos, P. (2018). Let's learn with Kahoot!! (Vol. 2018, pp. 677-685). Presentado en IEEE Global Engineering Education Conference, EDUCON. <https://doi.org/10.1109/EDUCON.2018.8363296>
- Espiritusanto, O. (2016). Generación Z: Móviles, redes y contenido generado por el usuario. *Revista de Estudios de Juventud*, 114, 111-126. <https://goo.gl/KRQjpb>
- Fernández-Cruz, F.J., & Fernández-Díaz, M. (2016). Los docentes de la Generación Z y sus competencias digitales. *Comunicar*, 24(46), 97-105. <http://dx.doi.org/10.3916/C46-2016-10>
- Gazotti-Vallim, M. A., Gomes, S. T., & Fischer, C. R. (2017). Vivenciando inglês com Kahoot!. *The ESPecialist: Descrição, Ensino e Aprendizagem*, 38(1), 1-18. <http://dx.doi.org/10.23925/2318-7115.2017v38i1a11>
- Guardia, J. J., Del Olmo, J. L., Roa, I., & Berlanga, V. (2019). Innovation in the teaching-learning process: The case of Kahoot! *On the Horizon*, 27(1), 35-45. <https://doi.org/10.1108/OTH-11-2018-0035>
- Guimares, D. (2015). Kahoot!: quizzes, debates e sondagens. En A.A.A. Carvalho. *Apps para dispositivos móveis: manual para professores, formadores e bibliotecários* (pp. 203-224). <http://goo.gl/btf1G3>
- Hanus, M. D., & Fox, J. (2015). Assessing the effects of gamification in the classroom: A longitudinal study on intrinsic motivation, social comparison, satisfaction, effort, and academic performance. *Computers & education*, 80, 152-161. <https://doi.org/10.1016/j.compedu.2014.08.019>
- Hernández-Ramos, J. P., Sánchez-Gómez, M. C., Martínez-Abad, F., & Torrijos, P. (2018). Gamificación en la universidad: Diseño, desarrollo y evaluación del empleo de Kahoot! en el aula. Satisfacción y rendimiento académico de los estudiantes en las asignaturas de metodología de investigación. *Universidad de Salamanca, MID. Memorias de Innovación Docente, 2017-2018*. <https://gredos.usal.es/handle/10366/138597>
- Hernández-Ramos, J. P., & Belmonte, M. L. (2020). Assessment of the use of Kahoot! in face-to-face and virtual higher education. *Education in the Knowledge Society*, 21(1), 23. <https://doi.org/10.14201/eks.22910>
- Hernández-Sampieri, R. (2014). *Metodología De La Investigación* (Edición: 6). McGraw-Hill.
- Holbrey, C. E. (2020). Kahoot!! Using a game-based approach to blended learning to support effective learning environments and student engagement in traditional lecture theatres. *Technology, Pedagogy and Education*, 1-12. <https://doi.org/10.1080/1475939X.2020.1737568>
- Ismail, M. A. A., & Mohammad, J. A. M. (2017). Kahoot!: a promising tool for formative assessment in medical education. *Education in Medicine Journal*, 9(2), 19-26. <https://doi.org/10.21315/eimj2017.9.2.2>
- Iwamoto, D. H., Hargis, J., Taitano, E. J., & Vuong, K. (2017). Analyzing the efficacy of the testing effect using Kahoot! on student. *Turkish Online Journal of Distance Education*, 18(2), 80-93. <https://doi.org/10.17718/tojde.306561>
- Licorish, S. A., Owen, H. E., Daniel, B., & George, J. L. (2018). Students' perception of Kahoot!!'s influence on teaching and learning. *Research and Practice in Technology Enhanced Learning*, 13(9), 1-12. <https://doi.org/10.1186/s41039-018-0078-8>
- Lin, D. T. A., Ganapathy, M., & Kaur, M. (2018). Kahoot!! It: Gamification in higher education. *Pertanika Journal of Social*

- Sciences and Humanities*, 26(1), 565-582.
<http://www.pertanika.upm.edu.my/>
- Lucke, T., Keyssner, U., & Dunn, P. (2013). The use of a Classroom Response System to more effectively flip the classroom. En *2013 IEEE Frontiers in Education Conference (FIE)* (pp. 491-495).
<https://doi.org/10.1109/FIE.2013.6684872>
- Maesaroh, M., Faridi, A., & Bharati, D.A.L. (2020). The effectiveness of socrative and Kahoot! to teach grammar to students with different interest. *English Education Journal*, 16(1), 366-373.
<http://journal.unnes.ac.id/sju/index.php/ej>
- Martínez-Abad, F., & Hernández Ramos, J. P. (2017). Flipped Classroom con píldoras audiovisuales en prácticas de análisis de datos para la docencia universitaria: percepción de los estudiantes sobre su eficacia. En S. Pérez-Aldeguer, G. Castellano-Pérez, & A. Pina-Calafi (Eds.), *Propuestas de innovación educativa en la sociedad de la información* (pp. 92-105). Adaya Press.
- Martínez-Navarro, G. (2017). Tecnologías y nuevas tendencias en educación: aprender jugando. El caso de Kahoot!. *Opción: Revista de Ciencias Humanas y Sociales*, 83, 252-277.
- Otzen, T., & Manterola, C. (2017). Técnicas de Muestreo sobre una Población a Estudio. *International Journal of Morphology*, 35(1), 227-232.
<https://doi.org/10.4067/S0717-95022017000100037>
- Pérez-Escoda, A., Castro-Zubizarreta, A., & Fandos-Igado, M. (2016). La competencia digital de la Generación Z: claves para su introducción curricular en la Educación Primaria. *Comunicar*, 49, 71-79.
<https://doi.org/10.3916/C49-2016-07>
- Plump, C. M., & LaRosa, J. (2017). Using Kahoot!! in the classroom to create engagement and active learning: A game-based technology solution for eLearning novices. *Management Teaching Review*, 2(2), 151-158.
<https://doi.org/10.1177/2379298116689783>
- Prieto, M. C., Palma, L. O., Tobías, P. J. B., & León, F. J. M. (2019). Student assessment of the use of kahoot in the learning process of science and mathematics. *Education Sciences*, 9(1).
<https://doi.org/10.3390/educsci9010055>
- Prieto, G., & Delgado, A. R. (2010). Fiabilidad y validez. *Papeles del psicólogo*, 31(1), 67-74.
- Resmayani, N. P. A., & Putra, I. N. T. D. (2020). Gamification: using Kahoot!! to make students love the class from the very Beginning. *Linguistics and ELT Journal*, 7(1), 10-18.
<http://journal.ummat.ac.id/index.php/JELT/article/view/1649/1228>
- Rodríguez-Fernández, L. (2017). Smartphones y aprendizaje: el uso de Kahoot! en el aula universitaria. *Revista Mediterránea de Comunicación*, 8(1), 181-190. 0.
<https://www.doi.org/10.14198/MEDCOM2017.8.1.13>
- Schroer, W. (2008). Defining, Managing, and Marketing to Generations X, Y, and Z. *The Portal*, 10, 9. <http://goo.gl/Fc40dB>
- Siegle, D. (2015). Technology: Learning can be fun and games. *Gifted Child Today*, 38(3), 192-197.
<https://doi.org/10.1177/1076217515583744>
- Siegel, S. (1990). *Estadística no paramétrica para ciencias de la conducta*. Trillas.
- Silva, J. B., Andrade, M. H., Rodrigues, R., Sales, G. L., & Vieira, F. R. (2018). Tecnologias digitais e metodologias ativas na escola: o contributo do Kahoot! para gamificar a sala de aula. *Revista Thema*, 15(2), 780-791.
<http://dx.doi.org/10.15536/thema.15.2018.780-791.838>
- Solanki, P., Khan, O., & Iqbal, M. (2020). Use of Kahoot!! to promote interactivity and social learning during multiple-choice questions. *BMJ Simulation and Technology Enhanced Learning*, 6(1), 35-36.
<http://dx.doi.org/10.1136/bmjstel-2018-000337>
- Tobias, S., Fletcher, J. D., & Wind, A.P. (2013). Game-based learning. In J. Spector, M. Merrill, J. Elen, & M. Bishop (Eds.), *Handbook of research on educational communications and technology* (pp. 485-503). Nueva York: Springer.
https://link.springer.com/chapter/10.1007/978-1-4614-3185-5_38

- Torres-Toukoumidis, Á., Ramírez-Montoya, M. S., & Romero-Rodríguez, L. M. (2018). Valoración y evaluación de los Aprendizajes Basados en Juegos (GBL) en contextos e-learning. *Education in the Knowledge Society, 19*(4), 109-128. <https://doi.org/10.14201/eks2018194109128>
- Vázquez-Cano, E., Fombona, J., Morales-Cevallos, M. B., & López-Meneses, E. (2025). Análisis del impacto del uso de una aplicación gamificada para la práctica de la ortografía en español en Educación Primaria. *Revista Latinoamericana de Tecnología Educativa, 24*(1), 9-28. <https://doi.org/10.17398/1695-288X.24.1.9>
- Villalustre, L. & Del Moral, M. E. (2015). Gamificación: Estrategia para optimizar el proceso de aprendizaje y la adquisición de competencias en contextos universitarios. *Digital Education Review, 27*(27), 13-31. <https://doi.org/10.1344/der.2015.27.13-31>
- Wang, A. I. (2015). The wear out effect of a game-based student response system. *Computers and Education, 82*, 217-227. <https://doi.org/10.1016/j.compedu.2014.11.004>
- Wang, A. I., & Lieberoth, A. (2016). The effect of points and audio on concentration, engagement, enjoyment, learning, motivation, and classroom dynamics using Kahoot!. In Proceedings from the 10th European Conference on Games Based Learning, (p. 738). Reading, UK: Academic Conferences International Limited.
- Wang, A. I., & Tahir, R. (2020). The effect of using Kahoot! for learning-A literature review. *Computers & Education, 145*, 1-22. <https://doi.org/10.1016/j.compedu.2020.103818>
- Yapıcı, I. U., & Karakoyun, F. (2017). Gamification in biology teaching: A sample of Kahoot! application. *Turkish Online Journal of Qualitative Inquiry, 8*(4), 396-414. <https://doi.org/10.17569/tojqi.335956>
- Zarzycka, E. (2014). Kahoot! it or not? Can games be motivating in learning grammar? *Teaching English with Technology, 16*(3), 17-36. <http://goo.gl/OpchTz>
- Zarzycka-Piskorz, E. (2016). Kahoot! it or not? Can games be motivating in learning grammar?. *Teaching English with Technology, 16*(3), 17-36. <https://www.ceeol.com/search/article-detail?id=420768>

