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Research article

Transforming Higher Education: The Power of Educational Breakouts

Transformando la Educación Superior: El Poder de los Breakouts Educativos

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Abstract:
Introduction: This research investigates the design process of educational breakouts within higher education, focusing on the perspectives of a teacher training program at a Spanish University. **Methodology**: Utilizing a qualitative approach, data were collected through a comprehensive survey to evaluate the perception concerning the design of these educational breakouts. The study identifies key strengths, such as enhanced engagement and creativity, while also highlighting challenges like technical difficulties and content complexity. It also explores the opportunities these methods present for fostering innovative teaching practices and skill development, alongside potential threats including technical issues, student engagement variability, and time constraints. **Results:** Findings suggest that while designing educational breakouts can significantly boost motivation and active learning, their effectiveness is contingent on proper training and resource allocation. **Discussions:** The discussion provides insights into improving teacher training programs through gamification, emphasizing the need for support in digital literacy and collaborative practices. **Conclusions**: Recommendations for future research include refining breakout designs to overcome identified challenges and optimizing their educational impact.

Keywords: gamification-based learning; educational breakout; higher education; digital literacy; innovation in education; active learning; engagement for learning; collaborative learning.

Resumen:
Introduction: Esta investigación examina el proceso de diseño de los *breakouts* educativos en la educación superior, centrado en las perspectivas de un programa de formación docente en una universidad española. **Metodología**: Utilizando un enfoque cualitativo, se recopilaron datos a través de una encuesta exhaustiva para evaluar el diseño de estos *breakouts* educativos. El estudio identifica fortalezas clave, como una mayor participación y creatividad, al tiempo que destaca desafíos como dificultades técnicas y la complejidad del contenido. También explora las oportunidades que estos métodos presentan para fomentar prácticas de enseñanza innovadoras y el desarrollo de habilidades, junto con amenazas potenciales que incluyen problemas técnicos, variabilidad en la participación estudiantil y limitaciones de tiempo. **Resultados:** Los hallazgos sugieren que, aunque el diseño de *breakouts* educativos puede aumentar significativamente la motivación y el aprendizaje activo, su efectividad depende de una capacitación adecuada y la asignación de recursos. **Discusión**: La discusión proporciona ideas para mejorar los programas de formación docente a través de la gamificación, enfatizando la necesidad de apoyo en la alfabetización digital y las prácticas colaborativas. **Conclusiones**: Las recomendaciones para futuras investigaciones incluyen perfeccionar los diseños de *breakouts* para superar los desafíos identificados y optimizar su impacto educativo.

Palabras clave: gamificación; breakout educativo; educación superior; alfabetización digital; innovación educativa; aprendizaje activo; motivación para el aprendizaje; aprendizaje colaborativo.

1. Introduction

Gamification has increasingly been recognized as a transformative teaching method in higher education (Domínguez et al., 2013; Huang et al., 2020). Traditional educational paradigms often struggle to maintain student interest and motivation, whereas gamification presents a dynamic alternative (Thurairasu, 2022). The concept of gamification in education involves the application of game mechanics, dynamics, and visual elements to improve perception, interaction, and social communication within a learning environment (Deterding, Nixon, Khale & Nake, 2011). By integrating components such as scores, awards, rankings, stages, feedback, and narratives, gamification seeks to create a more interactive and enjoyable learning experience. This approach aligns with the primary objective of motivating students in their education and supporting their academic progress through innovative and engaging methods (Gupta et al., 2023).

In higher education, gamification has proven particularly effective in inspiring and involving students. Researchers have found that gamified learning activities, typically facilitated by computers and created in digital environments, make educational content more accessible and engaging for students (Zainuddin et al., 2020). The digital nature of these activities not only caters to the tech-savvy nature of modern students but also provides a flexible and interactive platform for learning. Buckley and Doyle (2016) and De-Marcos et al. (2014) found that these interventions significantly increase student interest in the subject matter, leading to improved knowledge acquisition and retention. This heightened engagement fosters a deeper understanding of the material and encourages continuous learning and curiosity among students. By creating a more interactive and stimulating learning environment, gamification helps students to grasp complex concepts more effectively. Hakulinen & Auvinen (2014) assert that gamification-based learning aids in familiarizing students with educational content and enhances performance expectations. The anticipation of performance improvement, driven by the gamified approach, encourages students to invest more effort and attention into their studies, leading to better retention and comprehension of knowledge. This finding highlights the motivational power of gamification, where the game elements themselves drive students to strive for better performance.

Further research by Signori et al. (2018) and Whitton and Langan (2019) underscores the positive impact of gamification on learning outcomes. Signori et al. (2018) reveal that students exhibit enhanced learning outcomes when exposed to gamified instructional methods, promoting active participation, critical thinking, and problem-solving skills. This immersive approach fosters deeper understanding and long-term knowledge retention. Whitton and Langan (2019) highlight that gamification promotes a fun and enjoyable learning experience, creating a low-stress environment conducive to knowledge acquisition. This helps capture students' attention and sustain their interest in the subject matter, ultimately enhancing overall learning outcomes.

Additionally, Huang et al. (2020) demonstrate that the effectiveness of gamification largely depends on the specific game elements employed. Features such as challenges, rewards, and interactive components significantly enhance students' engagement and motivation. Careful selection and integration of these elements can create more effective and stimulating learning environments, maximizing educational benefits.

Therefore, integrating gamification into higher education offers numerous benefits, including enhanced student engagement, improved learning outcomes, and the creation of interactive and enjoyable learning environments. By leveraging game elements such as challenges, rewards, and interactive components, educators can foster deeper understanding, critical thinking, and long-term knowledge retention among students. As demonstrated by various studies, gamification is a powerful tool that can transform traditional educational paradigms and significantly enhance the academic experience.

1.1. Educational breakout

One of the latest trends in gamification is the use of educational breakouts, which are derived from escape rooms. Escape rooms require participants to solve puzzles and riddles to unlock a room within a set timeframe (Nicholson, 2018; Veldkamp et al., 2020). According to Botturi and Babazadeh (2020), a successful educational escape room includes five key elements: (i) a compelling narrative, (ii) a structured game pace, (iii) engaging puzzles, (iv) necessary equipment (physical or digital), and (v) a focus on the learning process. Fotaris & Mastoras (2022) recommend setting clear learning objectives beforehand and conducting evaluations afterward to ensure the game's goals align with the course's curriculum.

Educational breakouts are designed around immersive gae scenarios featuring specific learning objectives and instructional tasks, encouraging trial and error and leading to meaningful learning outcomes (Nicholson, 2015). Learners engage in environments such as deciphering secret codes, exploring haunted houses, or uncovering mysteries in medieval castles (Annetta, 2010; Douglas & Hargadon, 2001; Nicholson, 2015).

Participants are divided into teams to navigate fictional or real-world settings, encountering various characters, tools, and props, and solving cognitive challenges requiring critical thinking and logical reasoning (Kroski, 2020; Becker & Nicholson, 2016). This setup promotes collaboration and teamwork, as effective communication and resource sharing are essential. Learners act independently, relying on their skills and strategies, seeking help from instructors only for occasional hints or rule clarifications (Veldkamp et al., 2020). This independence fosters a sense of ownership and responsibility for their learning journey.

Typically, a time limit is imposed, adding competition, intensity, and excitement, and fostering a sense of achievement upon completion (Nicholson, 2018). This time constraint enhances engagement and motivation as participants race against the clock. These elements make educational breakouts a potent tool for developing critical thinking, problem-solving, and teamwork skills in a captivating and interactive setting.

Research has shown numerous beneficial learning outcomes associated with educational breakouts, including enhanced critical thinking, improved problem-solving abilities, and increased student engagement. However, significant challenges, such as limited time and resources, can impede their physical implementation (Fotaris & Mastoras, 2019). To overcome these challenges, educators can adopt digital breakouts, which offer similar educational benefits (Huang et al., 2020; Jimenez et al., 2020; Neumann et al., 2020). Digital breakouts enhance accessibility, flexibility, and ease of use, making them adaptable to various learning environments, including remote and hybrid settings. They allow educators to bypass logistical issues, providing an accessible platform for diverse educational contexts. They can be easily updated and customized, ensuring content remains relevant and challenging. The interactive nature of these digital tools can incorporate multimedia elements, enriching the learning experience. As a result, digital breakouts are an effective solution for modern educational settings, addressing the limitations of physical games while retaining their educational value (Cain, 2019).

Educational breakouts can transform traditional instructive experiences into dynamic and interactive sessions that capture students' interest. This is particularly relevant in teacher training programs, where they must develop innovative teaching strategies for their professional careers. Designing educational breakouts themselves serves a dual purpose: it engages students deeply with the content, and it prepares them to use these methods in their future classrooms, fostering a practical understanding of how to gamify educational content effectively. Nguyen et al. (2024) highlight that involving students in creating educational games enhances their creativity and pedagogical skills, making them more adept at implementing such strategies in real-world settings.

Despite the potential benefits, there is limited research on how higher education students perceive designing educational breakouts and the specific training they require to do so effectively. Studies by Nicholson (2015) and Borrego et al. (2017) emphasize the importance of providing adequate training and support to students, noting that successful implementation depends on their ability to integrate educational theory with practical game design principles. This includes balancing challenge and accessibility, ensuring the educational relevance of tasks, and creating a cohesive narrative that engages participants.

This study aims to explore higher education students' perceptions of an educational breakout they designed for an EFL university course. By examining their experiences and identifying the challenges and successes encountered, this research seeks to inform best practices for integrating gamification into teacher training programs. Understanding these perceptions is crucial for developing effective training programs that equip future educators with the skills and confidence to use educational breakouts to enhance student learning and engagement. The research questions addressed include:

1. How familiar are preservice teachers with educational breakouts before the practice?
2. What tools do preservice teachers use in designing educational breakouts?
3. What are the perceived strengths and weaknesses of these breakouts?
4. What opportunities do preservice teachers see in using educational breakouts to enhance learning experiences?
5. What opportunities do preservice teachers see in using educational breakouts to enhance learning experiences?

2. Methodology

The participants in this study were 106 students enrolled in an EFL course for preservice teachers at a public university in Spain. Among these students, 65,1% were female and 34,9% were male, with ages ranging from 20 to 50 years, and an average age of 20,29 years (Standard Deviation, SD = 1.52 years). The selection of participants was justified by their involvement in an EFL course at a Spanish University, providing a relevant and engaged cohort for the study.

Students were required to design a digital breakout project in groups based upon the different units of the EFL course. The project needed to include several challenges, each containing a secret code. When combined, these codes should unlock an encrypted PDF document that had to pose a thought-provoking question, based on the theoretical knowledge acquired during the course. Participants were free to choose their preferred ICT tools for designing the format of the breakout as well as for the educational puzzles and activities within it. This freedom not only fostered creativity but also enabled the pre-service teachers to explore and integrate various technological resources, thereby enhancing their digital literacy skills.

The instrument employed in this study was a survey, which was meticulously validated by a panel of experts, including teachers from the Primary Education program at a Spanish University. Regarding the survey validation process, a panel of experts who rigorously reviewed the survey to ensure its reliability and validity. This process included assessing the clarity, relevance, and appropriateness of the questions to ensure that they accurately captured the intended information. The survey was designed to capture a comprehensive range of responses and consisted of 8 open-ended questions that were crafted to elicit detailed and nuanced qualitative responses, providing rich insights into the participants' experiences and perceptions.

The data collected from the survey were analyzed using a qualitative methodology. The qualitative responses were analyzed using the text analysis tool NVivo. This tool facilitated the identification of key insights and trends by generating tags and categorizing the textual data, allowing for a systematic and comprehensive analysis of the qualitative feedback.

3. Results

Table 1 below shows all the questions of the survey, and the type of response collected for the analysis of the data. Although the survey consisted of open-ended questions, we categorized the responses to quantify the data.

Table 1.

Distribution of the answers to the questions of the questionnaire. N=106 students

N	Topic	Statement of the question	Type of response
1	Knowledge of educational breakouts	What did you know about educational breakouts before this practice, and where did you hear about them?	Open-ended question
2	Previous participation	Describe your previous experience with educational breakouts. Where did it take place, and what did you do?	Open-ended question
3	Tools used for the project	Which tools did you use for designing the educational breakout?	Open-ended question
4	Tools used for the challenges	Which tools did you use for designing the different challenges?	Open-ended question
5	Strengths of the design	What do you believe are the strengths of your educational breakout design?	Open-ended question
6	Weaknesses of the design	What do you believe are the weaknesses of your educational breakout design?	Open-ended question
7	Opportunities in the design	What opportunities do you see in your educational breakout design for enhancing learning experiences?	Open-ended question
8	Threats to the design	What potential threats or challenges do you foresee in the implementation of your educational breakout design?	Open-ended question

Source: Author's own creation (2024).

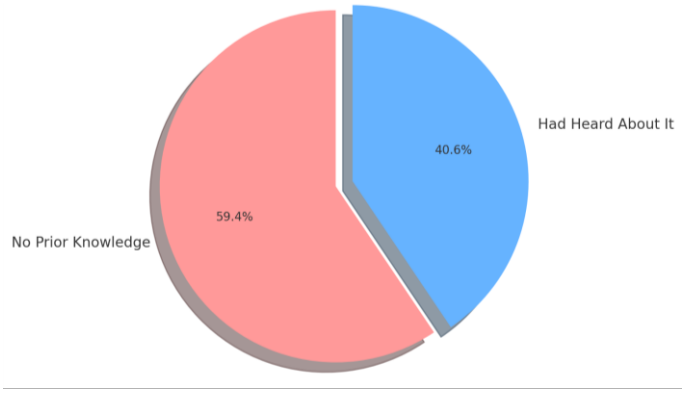
3.1. Perceptions of future teachers concerning the educative breakout design

3.1.1. Knowledge and familiarity with educational breakouts

Before participating in the project, 59.43% of respondents had never heard the term educational breakout, whereas 40.57% of respondents reported knowing what an educational breakout was before the practice. This group had diverse sources of familiarity, ranging from other courses and practical experiences to exposure through social media and previous school activities. Some students had encountered educational breakouts in specific subjects, such as ICT (Information and Communication Technology) or social science didactics, where these methods were integrated into the curriculum. Others had participated in similar activities under different names, such as escape rooms

Figure 1.

Familiarity with educational breakouts before the Practice



Source: Author's own creation (2024).

3.1.2. Previous experience with educational breakouts

The survey revealed that 68,9% of participants had not previously participated in an educational breakout, while 31,1% had. Those with prior experience often cited specific examples from secondary school or university courses. Some students provided specific examples of their experiences, such as participating in breakouts during secondary school or university courses. These detailed accounts highlight the effectiveness of educational breakouts in diverse settings and subjects. For instance, one respondent mentioned conducting a breakout activity in a 4th ESO class, which was well-received by classmates. Another noted the use of breakouts in the course "Estrategias", where guest lecturers facilitated an active breakout session.

3.1.3. Tools used for designing the educational breakout

From the responses, the tools used for designing educational breakouts primarily include Genially (59.4%), Canva (18.9%), PowerPoint (9.4%), and other unspecified tools (12.3%).

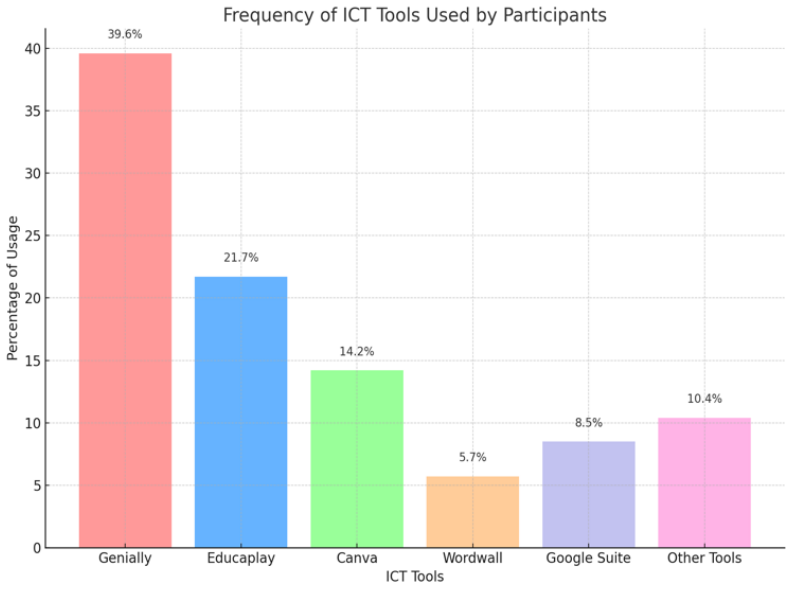
3.1.4. Tools used for designing the different challenges of the educational breakout

The frequency of the ICT tools utilized by the participants is as follows:

- Genially (39,6%) emerges as the most frequently used ICT tool among respondents.
- Educaplay (21,7%) is another prominent tool, allowing users to generate various types of educational activities such as quizzes, crosswords, and interactive maps.
- Canva was utilized by 14,2% of participants.
- Wordwall, a platform for creating interactive learning activities like quizzes and word games, was mentioned by 5,7% of respondents.
- Google Suite: Google's suite of tools, including Google Sites, Google Docs, and Google Forms, was employed by 8,5% of participants for collaboration, content creation, and data collection.
- Other Tools (10,4%): Various other ICT tools were mentioned sporadically, including Kahoot, Puzzle.org, YouTube, WhatsApp, VivaVideo, PowerPoint, and Paint.

Figure 2.

Tools used for designing the different challenges of the educational breakout



Source: Author's own creation (2024).

On the other hand, the categorization of the diverse application of ICT tools employed for the different challenges is as follows:

- Interactive Presentations: Genially, Prezi, and Google Slides were used to create presentations that served as the backbone of the breakout challenges.
- Quizzes and Games: Educaplay, Quizizz, Puzzle.org, Wordwall, and Kahoot were utilized to develop quizzes, puzzles, and interactive games that tested participants' knowledge and skills.
- Multimedia Content: YouTube, VivaVideo, and other video editing tools were employed to incorporate multimedia elements such as videos and animations into the breakout challenges.
- Collaborative Platforms: Google Suite, including Google Docs and Google Sites, facilitated collaborative work among team members, allowing them to create and share content seamlessly.
- Customized Content: Canva, Paint, and other design tools enabled participants to create custom graphics, illustrations, and visual elements tailored to the theme of their breakout challenges.

3.1.5. Strengths of Educational Breakout Designs

The responses were categorized into various themes to identify common strengths and their corresponding percentages:

- Creativity and Innovation: 30,2% (n=32). Participants highlighted the innovative and creative aspects of their designs, appreciating the novel approaches and unique elements that made the breakouts engaging: "Innovative and creative", "This work is innovative and creative, fostering our imagination".

- Engagement and Motivation: 26,4% (n=28). Many respondents noted that their designs were highly engaging and motivating for students: "Dynamic, motivating, and easy to manage", "Enhances student motivation".
- Interactivity and Use of Technology: 22,6% (n=24). The use of interactive elements and technology was frequently mentioned as a strength: "Highly interactive, requiring students to actively search for clues", "Interactive, fostering emotional intelligence".
- Storytelling and Thematic Consistency: 19.8% (21). The incorporation of compelling storyline and consistent themes throughout the breakout was a significant strength: "The narrative embedded within the game", "Our educational breakout consistently follows the thematic storyline".
- Educational Value and Content Coverage: 18.9% (n=20). Respondents appreciated the educational value of their designs, emphasizing the thorough coverage of course content and the integration of various educational concepts: "Meets all the objectives of the task", "Primarily, the diversity of content regarding the types of integrated games".
- Teamwork and Collaboration: 14.2%(n=15). The collaborative effort in creating the breakouts was highlighted as a strength. Working in teams helped enhance the quality of the designs and allowed for diverse ideas and approaches: "Group cohesion leading to competent work", "We maintained a consistent theme throughout the project, with appropriate division of labor".
- Fun and Enjoyment: 12.3% (n=13). The fun and enjoyable aspects of the breakouts were mentioned as key strengths. Participants noted that making learning fun helped retain students' interest and made the activities more effective: "It is enjoyable and aids in information retention", "Entertaining and playful".

Table 2.

Summary of Perceived Strengths

Strengths	Percentage	Number
Creativity and Innovation	30.2%	32
Engagement and Motivation	26.4%	28
Interactivity and Use of Technology	22.6%	24
Storytelling and Thematic Consistency	19.8%	21
Educational Value and Content Coverage	18.9%	20
Teamwork and Collaboration	14.2%	15
Fun and Enjoyment	12.3%	13

Source: Author's own creation (2024).

3.1.6. Weaknesses of Educational Breakout Designs

The survey also identified several weaknesses:

- Technical Issues and Accessibility: 25.5% (n= 27). Participants highlighted issues related to technical difficulties, such as slow performance, lack of sound, and challenges accessing digital platforms: "The program occasionally performs slowly", "Some computers do not allow access to the programs where we created the activities".

- Content and Complexity: 22.6% (n=24). Respondents noted difficulties with the complexity of content and the need for better contextualization. Some mentioned that certain activities were too simple or repetitive: "Some activities could have been better contextualized", "The audio for the videos we created did not achieve the desired quality".
- Team Collaboration and Effort: 14.2% (n=15). Several participants mentioned issues with team collaboration, noting that not all team members contributed equally to the project: "Lack of collaboration from certain group members", "Not all team members were equally committed to the design process".
- Time and Resource Constraints: 17.0% (n=18). Description: Time constraints and the extensive effort required for preparation and implementation were frequently mentioned: "It requires significant time and effort for preparation and application", "If we had more time, we could have created more activities to extend the duration".
- Engagement and Interest: 9.4% (n=10). Some respondents pointed out that the breakout design might not engage all students equally or might be too reliant on student interest in the chosen theme: "Students might not be interested in the chosen theme", "It could be challenging for those unfamiliar with the subject matter".
- No Significant Weaknesses: 14.2% (n=15). Several respondents stated that they did not find any significant weaknesses in their designs: "None", "I do not find any weaknesses".
- Specific Design Elements: 10.4% (n=11). Specific design elements such as the need for more diverse activities, inclusion of multimedia, and better use of technology were noted: "We could have created more complex activities", "Adding more videos with storytelling could further capture students' attention".

Table 3.

Summary of Perceived Weeknesses

Strengths	Percentage	Number
Technical Issues and Accessibility	25.5%	27
Content and Complexity	26.4%	24
Team Collaboration and Effort	14.2%	15
Time and Resource Constraints	17%	18
Engagement and Interest	9.4%	10
No Significant Weaknesses	14.2%	15
Specific Design Elements	10.4%	11

Source: Author's own creation (2024).

3.1.7. Opportunities of Educational Breakout Designs

The responses were categorized into various themes to identify common opportunities and their corresponding percentages.

- Engagement and Motivation: 28.3% (n=30). Participants highlighted the potential of their designs to engage and motivate students through interactive and dynamic activities: "It captures students' attention and can be applied to any subject and content", "It promotes dynamism and fun for students".
- Applicability and Versatility: 26.4% (n=28). Many respondents noted that their breakouts could be applied to various subjects and educational levels, demonstrating

versatility: "It is useful in classrooms", "Content can be taught while playing and enjoying the activity, in addition to promoting cooperative work".

- Innovative Teaching Method: 20.8% (n=22). The innovative nature of breakouts was frequently mentioned as an opportunity to introduce new teaching methods and move away from traditional approaches: "Innovates in the teaching-learning process", "It is a new way to assess without using traditional exams".
- Skill Development: 18.9% (n=20). Respondents emphasized the potential for developing various skills, including problem-solving, teamwork, and digital literacy: "It effectively develops all skills", "It develops logical thinking and memory".
- Content Reinforcement and Deep Learning: 17.0% (n=17). Many participants saw opportunities for reinforcing content and promoting deep learning through interactive and engaging activities: "Deep learning of key concepts in the subject", "It enables meaningful learning and dynamic review of essential subject content".
- Future Application and Practical Use: 13.2% (n=14). Several participants mentioned that the breakout design could be used in future teaching scenarios, highlighting its practical application: "As a future teacher, I will always have this educational breakout available", "It can be applied in the future".

Table 4.

Summary of Perceived Opportunities

Opportunities	Percentage	Number
Engagement and motivation	28.3%	30
Applicability and versatility	26.4%	28
Innovative teaching method	20.8%	22
Skill development	18.9%	20
Content reinforcement and deep learning	17%	17
Future application and practical usage	13.2%	14

Source: Author's own creation (2024).

3.1.8. Threats to Educational Breakout Designs

The survey also identified several threats:

- Technical Issues and Accessibility: 24.5% (n=26). Participants highlighted concerns related to technical difficulties, such as internet connectivity, problems with digital platforms, and lack of access to necessary devices: "Internet failures and lack of connection impede Access", "Technical issues with ICTs".
- Student Engagement and Motivation: 19.8% (n=21). Some respondents noted that not all students might find the theme or activities engaging, which could affect their motivation and participation: "Not everyone will feel motivated if they do not like the theme", "Students might focus more on the story than the activities".
- Content and Complexity: 18.9% (n=20). Issues related to the complexity of the content, difficulty in understanding tasks, and ensuring that all relevant content is included were mentioned: "It can be confusing if the proposed theme is not well understood", "Inability to include all the required content".
- Time and Resource Constraints: 17.0% (n=17). Concerns about the time and effort required to design and implement the breakout activities, as well as the need for sufficient resources: "Both the creation and future development of the educational

breakout require significantly more time than traditional teaching", "It is a breakout that needs a lot of dedication due to all the small details".

- Copying and Lack of Originality: 13.2% (n=14). Participants expressed concerns about their designs being copied by others, reducing the uniqueness and originality of their work: "The idea could be copied", "Others could replicate our design".
- No Significant Threats: 28.3% (n=30). Several respondents stated that they did not find any significant threats in their designs: "The idea could be copied", "Others could replicate our design".

Table 5.

Summary of Perceived Threats

Threats	Percentage	Number
Technical issues and accesibility	24.5%	26
Student engagment and motivation	19.8%	21
Content and complexity	18.9%	20
Time and resource constraints	17%	17
Copying and lack of originality	13.2%	14
No significant threats	28.3%	30

Source: Author's own creation (2024).

4. Discussion

The integration of gamification and educational breakouts in higher education represents a promising yet complex innovation in teaching methodologies. This study illuminates future teachers' perceptions of these methods, revealing both enthusiasm and concern. A significant portion of participants (59.43%) were unaware of educational breakouts before the project, highlighting a considerable knowledge gap. Furthermore, 68.9% of respondents had not previously engaged in educational breakouts, underscoring the novelty of this methodology in their educational experiences. However, the 31.1% of participants with prior experience generally reported positive outcomes, suggesting a potential for wider adoption as familiarity and comfort with the method increase.

This lack of awareness about educational breakouts aligns with existing research, indicating that innovative teaching methods often encounter initial opposition due to unfamiliarity. Various factors contribute to this reluctance, including teachers' hesitation to integrate technology and the inherent challenges of adopting new pedagogical approaches. One primary reason for resistance among educators is the negative affective response to technology. Studies have shown that anxiety and stress associated with the use of new technologies can hinder their adoption (Howard, 2010; Ertmer & Ottenbreit-Leftwich, 2010). Teachers often feel overwhelmed by the learning curve required to master new tools and fear that technology will complicate their teaching rather than simplify it (Martínez-Otero, 2003; González & Vargas, 2009). This fear is compounded by the high-stakes environment of education, where teachers are pressured to meet specific standards and outcomes, making them risk-averse and hesitant to experiment with unfamiliar methods.

Moreover, the inclusion of educational technology often demands significant technical resources and equipment, which may not always be available. This lack of resources creates additional tension and frustration among teachers expected to integrate technology into their

classrooms without adequate support (Fernández-Batanero et al., 2021). Therefore, it is crucial addressing these concerns for fostering a more positive attitude towards the adoption of innovative teaching methods such as educational breakouts.

Regarding the ICT Tool used for designing the educational breakout, the preference for Genially (59.4%) over other tools such as Canva (18.9%) and PowerPoint (9.4%) underscores the importance of interactive and visually engaging content in educational breakouts. This finding supports previous studies emphasizing the role of interactive digital tools in enhancing student engagement and learning outcomes (Dichev & Dicheva, 2017).

The diverse use of ICT tools in educational breakout challenges reflects the evolving landscape of digital learning. Gamification and the use of digital tools in education are rapidly growing fields, focusing on improving user engagement and intrinsic motivation through interactive and game-like elements. The significant usage of tools like Genially and Educaplay indicates a trend towards creating more interactive and engaging educational experiences, aligning with the broader goals of gamification research. Likewise, the analysis of the ICT tools usage among participants reveals a strong inclination towards tools that enhance interactivity, collaboration, and customization in educational settings. This trend is consistent with the growing emphasis on gamification and digital engagement strategies in education (Trinidad et al. 2021). By leveraging these tools, educators can create more dynamic, inclusive, and effective learning environments that cater to the diverse needs of their students.

Respondents identified creativity and innovation (30.2%), engagement and motivation (26.4%), and interactivity and use of technology (22.6%) as key strengths of educational breakouts. This aligns with multiple studies that report gamified learning environments enhance student motivation and engagement by incorporating game elements that make learning more interactive and enjoyable (Sailer & Homner, 2020; Dicheva et al., 2015; Whitton & Langan, 2019). Conversely, some studies suggest that the effectiveness of gamification can diminish over time. Deterding et al. (2011) argue that the initial novelty of gamified learning can wear off, potentially reducing long-term engagement and effectiveness. Similarly, Hanus and Fox (2015) found that while initial engagement might be high, it can decrease if the gamified elements are not continually updated and made relevant to the learners. This indicates that while educational breakouts may be initially engaging, their long-term impact on student engagement needs further investigation and continuous innovation to sustain interest.

The complexity of content and the need for better contextualization were highlighted as major concerns in the study. Nicholson (2015) stresses that effective gamification requires a careful balance between challenge and accessibility, indicating that poorly designed content can hinder the learning process. Borrego et al. (2017) found that providing structured guidelines and examples of best practices can help educators develop more effective and meaningful gamified activities. Additionally, Annetta (2010) argues that the inclusion of immersive narratives and relevant contexts in educational games enhances student engagement and learning outcomes. Some studies suggest that complexity in gamified learning can be beneficial if appropriately managed. Annetta (2010) argues that complex gamified tasks can enhance critical thinking and problem-solving skills, provided that students receive adequate support and scaffolding. This suggests that while complexity is a challenge, it can also be an opportunity for deeper learning if managed correctly. Similarly, Barata et al. (2013) found that well-structured complex tasks in gamified environments can foster higher-order thinking skills and improve overall academic performance.

Despite the benefits of educational breakouts for promoting collaboration and teamwork (Vermeulen et al., 2016), some participants reported unequal contributions from team members and a lack of coordination associated with workload distribution. This aligns with Hamari et al. (2014), who suggested that team dynamics can sometimes lead to imbalanced participation, with some students dominating the activities while others are less involved. Liu et al. (2017) observed that the effectiveness of collaborative gamified learning can be hampered by social loafing, where some team members contribute less effort, relying on the more active participants. This indicates that while educational breakouts can promote teamwork, they must be carefully designed to ensure balanced participation and avoid reinforcing existing inequalities.

The study also highlighted several opportunities that educational breakouts offer. The potential to engage and motivate students was seen as one of the most significant benefits. Breakouts' dynamic and interactive nature can make learning more enjoyable and immersive, encouraging students to invest more effort and attention in their studies. The versatility of breakouts, with their applicability across various subjects and educational levels, further enhances their value as an innovative teaching method. This flexibility allows educators to tailor breakouts to specific learning objectives and contexts, making them a powerful tool for fostering skill development and content reinforcement. These opportunities align with findings from other studies. For instance, Lasley (2017) highlighted the potential of game-based learning to develop critical thinking, problem-solving, and digital literacy skills. Additionally, Borrego et al. (2017) found that escape room activities, a form of educational breakout, facilitated motivation and learning in computer science students, supporting the notion that breakouts can be effective across various disciplines.

The threats identified in the study, such as technical issues and the challenge of maintaining student engagement, are consistent with the broader challenges of integrating technology into education. Ensuring that all students have access to the necessary technology and are motivated by the breakout content is essential for the success of these activities. Additionally, concerns about the complexity of content and time and resource constraints underscore the need for careful planning and resource allocation.

This study, while providing valuable insights into the use of educational breakouts in higher education, is subject to several limitations. The research was conducted with a relatively small and homogenous sample from a single institution, which may not fully represent the broader population of higher education students. Additionally, the study's short-term evaluation did not assess long-term impacts on student learning and teacher preparedness. Future research should address these limitations by including larger, more diverse samples, employing longitudinal studies, and exploring a broader range of tools and techniques to provide a more comprehensive understanding of the potential of educational breakouts in diverse educational contexts.

5. Conclusions

The integration of gamification and educational breakouts in higher education presents both significant opportunities and notable challenges. This study has illuminated the potential of these innovative methods to enhance student engagement, motivation, and creative learning. Educational breakouts, when effectively designed and implemented, can transform traditional teaching methodologies by fostering active, experiential learning and leveraging technology to create engaging educational experiences.

The findings from this research underscore the numerous strengths of educational breakouts, such as their ability to promote creativity, interactivity, and thematic consistency. These strengths highlight the potential of educational breakouts to make learning more dynamic and enjoyable, thereby enhancing student learning outcomes. By engaging students in immersive game scenarios that require problem-solving, critical thinking, and teamwork, educational breakouts can foster deeper understanding and long-term knowledge retention.

However, the study also brings to light several challenges that must be addressed to maximize the effectiveness of educational breakouts. Technical issues, such as slow performance and lack of access to necessary digital platforms, were identified as significant barriers. These issues can hinder the seamless integration of educational breakouts into the learning process and may detract from the overall student experience. Additionally, the complexity of content and the need for better contextualization were highlighted as areas requiring careful consideration. Ensuring that the content is both challenging and accessible is crucial for maintaining student engagement and promoting meaningful learning.

Collaboration and team dynamics also emerged as important factors in the successful implementation of educational breakouts. While these activities have the potential to enhance teamwork and collaborative learning, issues related to unequal participation and coordination among team members were noted. Addressing these challenges requires the development of strategies to ensure balanced participation and effective collaboration, thereby maximizing the benefits of teamwork in educational breakouts.

The study further emphasizes the importance of providing comprehensive training and support for educators. Adequate training in both the technical and pedagogical aspects of educational breakouts is essential for educators to effectively design and implement these activities. This includes understanding how to integrate game elements into the curriculum, creating engaging and educational puzzles, and managing the logistical aspects of breakout activities. Providing ongoing support and resources can help educators overcome technical challenges and enhance their confidence and competence in using gamified teaching methods. Future research should focus on refining the design and implementation of educational breakouts to address the identified challenges and maximize their educational impact. Longitudinal studies that follow educators and students over time can provide deeper insights into the sustained impact of educational breakouts on learning and teaching. Additionally, expanding the sample to include a more diverse range of participants from different educational levels, disciplines, and cultural contexts can provide a more comprehensive understanding of the effectiveness and challenges of this methodology.

Comparative studies evaluating the effectiveness of educational breakouts against other innovative teaching methodologies can help identify the relative advantages and limitations of different approaches. Investigating the barriers and facilitators for the adoption of educational breakouts from the perspective of educators can provide practical insights for developing more effective and sustainable implementation strategies.

In conclusion, while educational breakouts hold significant promise for enhancing teaching and learning, their successful implementation requires careful planning, adequate resources, and ongoing support. By addressing the challenges and building on the opportunities identified in this study, educators can leverage educational breakouts to create more engaging, effective, and dynamic learning environments. Ultimately, this can contribute to a more innovative and responsive educational landscape, preparing students for the dynamic demands of the 21st-century workforce.

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