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Gamified teaching model to promote meaningful learning in preschool students

Modelo didáctico gamificado para promover el aprendizaje significativo en estudiantes de preescolar

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ABSTRACT

In the Colombian educational context, preschool education faces significant challenges that require innovative methodologies that respond to the cognitive and emotional characteristics of early childhood. This study aimed to propose a gamified teaching model to promote meaningful learning in preschool students. A qualitative approach with a phenomenological design was used, including interviews with nine transition teachers and participant observation at the Nuestra Señora del Pilar Educational Institution in Bucaramanga. The results revealed that teachers intuitively implement gamified elements but lack a systematic conceptual framework to optimise these strategies. Three main categories were identified: context and general strategies, gamification approach, and reflection on teaching practice. In conclusion, a comprehensive gamified teaching model with four fundamental components was proposed, providing a comprehensive structural framework for transforming preschool educational experiences.

Keywords: preschool-aged children; nursery school; early childhood education. (Source: UNESCO Thesaurus).

RESUMEN

En el contexto educativo colombiano, la educación preescolar enfrenta desafíos significativos que demandan metodologías innovadoras que respondan a las características cognitivas y emocionales de la primera infancia. Este estudio tuvo como objetivo proponer un modelo didáctico gamificado para promover el aprendizaje significativo en estudiantes de preescolar. Se empleó un enfoque cualitativo con diseño fenomenológico, incluyendo entrevistas a nueve docentes de transición y observación participante en la Institución Educativa Nuestra Señora del Pilar en Bucaramanga. Los resultados revelaron que los docentes implementan intuitivamente elementos gamificados pero carecen del marco conceptual sistemático para optimizar estas estrategias. Se identificaron tres categorías principales: contexto y estrategias generales, enfoque de gamificación, y reflexión sobre práctica pedagógica. Como conclusión, se propuso un modelo didáctico gamificado integral con cuatro componentes fundamentales que proporciona un marco estructural comprehensivo para transformar las experiencias educativas preescolares.

Descriptores: niño en edad preescolar; escuela de párvulos; educación de la primera infancia. (Fuente: Tesauro UNESCO).

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Research articles

INTRODUCTION

In the contemporary Latin American educational context, particularly in Colombia, preschool education faces significant challenges related to the need to implement methodologies that effectively respond to the cognitive and emotional characteristics of early childhood. The socio-educational reality of the region demands innovative pedagogical strategies that not only promote meaningful learning but also consider the cultural, socioeconomic, and technological particularities of the national context.

In Colombia, preschool education must address the specific needs of a child population characterised by cultural diversity, different levels of access to technological resources and varied socio-family conditions. In this regard, Alarcón-Curay et al. (2024) argue that pedagogy in early childhood education requires methodological approaches that consider the particularities of child development, recognising that teaching-learning processes at this stage must be based on principles that respect the natural rhythms of growth and the specific ways of constructing knowledge characteristic of early childhood in Latin America.

In this context, gamification emerges as a promising pedagogical alternative that can significantly transform educational experiences at the preschool level, especially relevant in a region where play is a central element of children's culture and where educational institutions seek methodologies that can be effectively implemented regardless of technological or economic limitations.

Similarly, Guaman et al. (2024) argue that play is a fundamental element in student cognitive development, especially during the early years of schooling in the Colombian educational context. This perspective reinforces the importance of incorporating playful elements into educational processes, not as complementary activities, but as essential components of pedagogical methodology. Gamification, understood as the application of game mechanics in non-playful contexts, represents a natural evolution of this understanding of the role of play

in education, particularly relevant in a society where children's play traditions are an integral part of the cultural heritage.

Furthermore, Araujo-Varon (2023) demonstrates that symbolic play functions as an effective playful-didactic strategy to strengthen meaningful learning in preschool students in Colombian educational institutions. This research, carried out in the specific context of San Vicente del Caguán-Caquetá, shows that gamified activities not only increase student motivation but also facilitate the construction of lasting and transferable knowledge in child populations with specific sociocultural characteristics of the region. These results suggest that the systematic implementation of gamified strategies can generate positive transformations in early childhood education processes, especially when adapted to local and regional realities.

However, the effective implementation of gamification in preschool education requires solid theoretical frameworks and structured teaching models to guide teaching practice in the specific context of Colombian educational institutions. In this regard, from the researcher's perspective, it is worth mentioning that many preschool institutions in the country face limitations in terms of technological resources, specialised teacher training and access to innovative teaching materials. The absence of comprehensive methodological proposals that coherently articulate the principles of gamification with theories of meaningful learning, considering these contextual limitations, represents a significant limitation in the current pedagogical field. This situation justifies the need to develop specific teaching models that respond to the particular characteristics of the preschool context.

Consequently, the overall objective of this study is to propose a gamified teaching model to promote meaningful learning in preschool students in the Colombian educational context.

Theoretical framework

Educational gamification is based on the systematic application of elements, mechanics and dynamics typical of games in teaching-learning contexts.

According to Márquez-Ramírez & Angulo-Armenta (2024), the use of gamification in teaching practices has experienced exponential growth in recent decades in the Latin American context, driven by the recognition of its potential to transform traditionally passive educational environments into interactive and motivating spaces, which is especially relevant in educational systems where active student participation is a constant challenge.

From this perspective, Navarro-Mateos et al. (2021) establish that gamification in the Spanish educational setting has proven effective at multiple educational levels, generating positive impacts on student motivation, participation, and academic performance. This empirical evidence, although developed in European contexts, supports the viability of implementing gamified strategies in various educational contexts, including Latin American preschool education, where cultural and social characteristics can further enhance the benefits of these methodologies.

In addition, Prieto-Andreu et al. (2022) demonstrate that there is a direct relationship between gamification, motivation, and performance in education. Their systematic review reveals that students exposed to gamified methodologies show higher levels of engagement, perseverance, and satisfaction with learning processes. These results suggest that gamification is not merely an entertainment strategy, but a pedagogical tool with solid scientific foundations, particularly valuable in contexts where student motivation is affected by socioeconomic factors or limitations in traditional educational resources.

In the specific context of primary education, Morales-Pérez & Reyes-Cardona (2022) confirm that gamification as a teaching technique generates significant improvements in teaching and learning processes in Colombian educational institutions. Their research shows that primary school students respond positively to game mechanics integrated into academic activities, developing cognitive and socio-emotional skills simultaneously. This finding is particularly relevant for the national education system, where comprehensive

education is one of the fundamental pillars established by the Ministry of National Education.

Meaningful learning in preschool education

Meaningful learning, originally conceptualised by Ausubel, takes on particular characteristics in the context of Colombian preschool education. In this context, Zambrano-Solórzano et al. (2022) argue that gamification as a teaching strategy effectively contributes to the development of meaningful learning in early education students, facilitating the construction of knowledge that integrates coherently with pre-existing cognitive structures. This perspective is particularly relevant in the national context, where the cultural and linguistic diversity of the child population requires pedagogical strategies that respect and take advantage of prior knowledge derived from different family and community traditions.

In relation to this approach, Montaño & Enríquez (2022) identify that teaching strategies in early childhood education should consider the particularities of early cognitive development. Their systematic review reveals that the most effective pedagogical approaches are those that combine playful, sensory and experiential elements, creating optimal conditions for learning to transcend superficial memorisation and consolidate itself as lasting and applicable knowledge. In the Colombian educational context, where many institutions serve populations with different levels of early stimulation, this comprehensive approach becomes essential to ensure equity in learning opportunities.

For their part, Araujo-Varon (2023) specifically demonstrate that symbolic play strengthens meaningful learning in preschool students. This research shows that playful activities not only capture children's attention, but also facilitate complex cognitive processes such as abstraction, generalisation and the transfer of knowledge to new situations.

Gamification and the development of logical-mathematical thinking

A particularly relevant area in preschool education is the development of logical-mathematical thinking. In response to this, Cuadrado-Tapia et al. (2024) establish that gamification in mathematics learning is an effective strategy for student participation. Their research shows that game elements significantly increase interest in and understanding of fundamental mathematical concepts, a crucial aspect in the Ecuadorian educational context and applicable to the Colombian reality, where indicators of mathematical competence in early education need to be strengthened.

In line with this perspective, Ramírez-Benavides (2024) analyses the role of video games in the development of mathematical logical thinking in preschool students. Their systematic review reveals that gamified digital tools promote the construction of basic numerical skills, pattern recognition and the development of problem-solving skills. This approach is particularly valuable in the national context, where the digital divide can be mitigated through gamified strategies that do not rely exclusively on sophisticated technologies.

Similarly, Screpnik et al. (2023) examine the application of video games in early mathematics education. Their results indicate that gamified platforms allow for the personalisation of learning processes, adapting to individual rhythms and providing immediate feedback that reinforces the construction of mathematical knowledge.

From another perspective, Pazmiño-Arcos et al. (2024) analyse virtual strategies for developing logical-mathematical thinking in students. Their research establishes that gamified digital tools, when implemented appropriately, can overcome the limitations of traditional approaches, offering more engaging and effective learning experiences.

Gamification in physical education and comprehensive development

Gamification transcends traditional academic areas and extends to physical education. In this vein, Gaibor (2023) examines gamification for teaching physical

education, establishing that this strategy promotes not only motor development but also social, emotional, and cognitive skills. This comprehensive perspective reinforces the importance of considering gamification as a cross-curricular methodology that contributes to the holistic development of preschool students.

Educational technology and gamification

The integration of technology into gamified processes is another relevant aspect. In response to this, Lardín et al. (2023) analyse gamification in the classroom through Minecraft Education, demonstrating that specialised digital platforms can significantly enrich gamified educational experiences. Their research suggests that technology, when used appropriately, amplifies the benefits of gamification without replacing the fundamental human interaction in the educational process.

In the context of higher education, Arias & Mon (2022) examine the gamified flipped classroom as a pedagogical strategy. Although their focus is on higher education levels, their results provide valuable insights into the effective integration of technology and gamification, principles that can be adapted to the preschool context considering the particularities of child development.

METHOD

This study is framed within the interpretive paradigm, which allows for the study of changing reality through the use of a rich and varied methodology that complements valid methods, techniques, and instruments. This paradigm facilitates the acquisition of knowledge, interpretation and understanding of the object of study, recognising that sociocultural and educational phenomena are best described and understood through qualitative analysis, within an intersubjective and contextual epistemological relationship.

A qualitative approach with a phenomenological design was adopted, focusing on the in-depth understanding and description of educational experiences from the participants' point of view. This method, developed by Husserl, sets out fundamental principles such as the epoché attitude (suspension of judgements

and preconceptions about the phenomenon under study) and phenomenological description to detail experiences as they are lived by those who experience them.

The study corresponds to a projective research with a qualitative approach, following the phenomenological research model. A non-experimental cross-sectional design was implemented, where information was collected at a specific point in time to analyse the perceptions and experiences of preschool teachers on gamification and meaningful learning.

The research setting was the Nuestra Señora del Pilar Educational Institution, located in the city of Bucaramanga, Santander, Colombia. This official institution serves approximately 3,800 students in academic and technical-commercial programmes, distributed across six campuses ranging from preschool to secondary education.

The participants were nine (9) transition grade teachers, selected through intentional sampling considering the following criteria: minimum experience of five years in preschool education, willingness to participate in the study, and representative distribution among the different campuses of the institution. The key informants were coded as DGT1 to DGT9 to ensure their anonymity. Two main information collection techniques were used:

1. Participant observation: Systematic observations were made in preschool classrooms to analyse the teaching strategies used by teachers and the responses of students. The findings were recorded in field journals following a structured format that considered aspects such as teaching techniques, gamification, teacher and student performance, motivation, and teaching-learning processes.
2. In-depth interviews: Semi-structured interviews were conducted with the nine participating teachers, with open-ended questions that explored their perceptions of motivation strategies, gamification, meaningful learning, and teaching practice. The interviews were digitally recorded with the informed consent of the participants.

Three main categories were identified: (1) Context and General Strategies, (2) Approach to Gamification, and (3) Reflection on Teaching Practice. Subsequently, source triangulation was carried out to validate the findings by comparing interview data, observations and theoretical references.

The validity of the study was ensured through: triangulation of data sources (interviews and observations), expert validation of data collection instruments, and verification of the internal consistency of the analysis. Reliability was ensured through detailed documentation of the methodological process and systematic coding of the data.

The research was conducted in accordance with the ethical principles established by the American Educational Research Association (AERA). Informed consent was obtained from all participants, confidentiality and anonymity of data were guaranteed, and teachers' rights to withdraw from the study at any time were respected. The research was approved by the relevant institutional authorities.

RESULTS

The analysis of the information collected through interviews and participant observation allowed us to identify three main categories that emerged from the experiences and perceptions of the participating teachers: (1) Context and general strategies, (2) Approach to gamification, and (3) Reflection on teaching practice.

Category 1: Context and general strategies

The participating teachers reported a predominant use of playful strategies in their teaching practices, with games being the main tool used to motivate students. As one of the informants stated: "Play is the tool I use in most cases to motivate my students" (DGT1). This trend is in line with the findings of Guaman et al. (2024), who argue that play is a fundamental element in student cognitive development during the early years of schooling.

Teachers reported implementing guiding activities established by the Ministry of National Education, including art, play, literature, and exploration of the environment. According to one participant: "Guiding activities such as art, play,

literature, and exploration of the environment, storybooks, audiovisual material, and manipulative material. They are applied in order to guide a teaching-learning process" (DGT2). This approach is consistent with that proposed by Araujo-Varon (2023), who demonstrates that symbolic play functions as an effective playful-didactic strategy for strengthening meaningful learning in preschool students.

The development of concrete materials emerged as a significant practice among teachers, who reported creating teaching resources both individually and in collaboration with students. This strategy of "learning by doing, building knowledge with real and graphic materials" (DGT3) reflects the implementation of constructivist principles in pedagogical practice, consistent with the approaches of Montaño & Enríquez (2022) on the importance of combining playful, sensory and experiential elements in early childhood education.

Category 2: Gamification approach

The analysis revealed significant conceptual confusion between the terms "gamification" and "play" among the participating teachers. While some recognised the potential of gamification, they expressed a lack of knowledge about its specific implementation. One teacher stated, "I don't know that term" (DGT5), while another noted, "I would need help understanding how to adapt gamification concepts to my curriculum" (DGT8).

Despite this conceptual unfamiliarity, teachers who implemented gamified strategies reported positive impacts on student motivation. As one participant stated: "The application of strategies in the teaching of preschool content has a positive effect on student motivation, making learning more interesting, inclusive, independent, successful, and meaningful for them" (DGT4). These results are consistent with the research of Prieto-Andreu et al. (2022), who demonstrate that there is a direct relationship between gamification, motivation and performance in education.

Teachers identified specific benefits of gamification in the development of cognitive and socio-emotional skills. According to one of the informants: "The impact on children can be seen when they manage to organise their ideas by expressing them and solving problems, allowing them to acquire new skills that strengthen their overall development" (DGT6). This perception is in line with the

findings of Cuadrado-Tapia et al. (2024), who establish that gamification in mathematics learning is an effective strategy for student participation.

Category 3: Reflection on teaching practice

The participating teachers expressed a positive attitude towards pedagogical innovation and an interest in receiving training in gamification. As one of the informants said: "Yes, of course this technique has helped me. All the training they provide us with is welcome to help the students' learning process" (DGT7). This willingness to engage in continuous training is essential for the successful implementation of innovative strategies, as suggested by Márquez-Ramírez & Angulo-Armenta (2024) in their state-of-the-art review on the use of gamification in teaching practices.

However, some teachers were found to be partially resistant to change, preferring traditional methodologies. One participant stated: "I don't know because I haven't used it and I stick to traditional methodology" (DGT9). This resistance suggests the need for support and training processes to facilitate the transition to more innovative methodologies.

Teachers recognised the importance of gamification in creating dynamic and creative environments in the classroom. According to one participant: "I use them with the intention of creating a dynamic, creative environment and generating excitement among students for the new learning to be incorporated" (DGT3). This perception is consistent with the findings of Zambrano-Solórzano et al. (2022), who argue that gamification as a teaching strategy effectively contributes to the development of meaningful learning in early childhood education students.

Triangulation of findings

Triangulation between interview data, observations and theoretical references confirmed the existence of a gap between theoretical knowledge about gamification and its practical implementation in preschool classrooms. Teachers intuitively implement gamified elements in their teaching practices, but lack the conceptual framework necessary to optimise these strategies.

Classroom observations corroborated the predominant use of playful activities and the incorporation of motivational elements in classes, although without a systematic gamification structure. This situation is consistent with the findings of

Navarro-Mateos et al. (2021), who identified that gamification in Spanish education has proven effective but requires specific training for its proper implementation.

PROPOSAL: GAMIFIED TEACHING MODEL FOR PRESCHOOL EDUCATION

Based on the results obtained from the analysis of teaching experiences and the review of specialised literature, a gamified teaching model is proposed that coherently integrates the principles of meaningful learning with game mechanics appropriate for preschool cognitive development. The model responds to the needs identified in the teaching practice of the participating teachers and is based on empirical evidence on the effectiveness of gamification in early education.

The results of the study revealed that teachers intuitively implement gamified elements in their practices but lack a systematic conceptual framework to optimise these strategies. As one participant stated: "It is said to be a beneficial strategy for students, I would like to learn about it and be trained in it so that I can apply it" (DGT8). This training need underpins the importance of developing a structured model to guide teaching practice.

Component 1: Design of contextualised playful experiences

This component is based on evidence provided by participating teachers on the importance of creating engaging narratives that connect with student interests. According to Araujo-Varon (2023), symbolic play is the foundation for creating meaningful contexts that facilitate the construction of lasting knowledge in preschool students.

The teachers in the study emphasised the importance of starting from "the interests of the students" (DGT1) and creating experiences of "learning through meaningful experiences" (DGT2). This practice is aligned with the principles of contextualisation identified in the literature, where Zambrano-Solórzano et al. (2022) demonstrate that gamification should start from students' prior knowledge and cultural experiences.

The implementation of this component requires teachers to develop skills to design stories, characters, and scenarios that serve as narrative frameworks, incorporating local cultural elements and promoting student identification with the

content presented, as suggested by the participants when emphasising the importance of relating "what is learned to the context" (DGT3).

Component 2: Implementation of educational game mechanics

The game mechanics selected should align with the specific learning objectives identified by the participating teachers. Based on the results of Cuadrado-Tapia et al. (2024), mechanics are proposed that include systems of recognition for academic achievement, progressive difficulty levels, collaborative challenges, and symbolic rewards.

The teachers in the study expressed the importance of "teamwork" (DGT4) and "playful-educational activities" (DGT5), highlighting the need to incorporate collaborative mechanics. Progression through levels should be designed considering that teachers report dedicating "time to each student" (DGT6), recognising individual areas of proximal development.

Component 3: Gamified formative assessment

Assessment in the proposed model integrates game mechanics that turn assessment processes into additional learning experiences. Participating teachers expressed the importance of "motivating and valuing their efforts" (DGT7), which is in line with the recommendations of Zambrano-Solórzano et al. (2022) on gamified assessment that provides immediate and specific feedback.

Gamified assessment tools include knowledge exploration missions, practical application challenges, and playful self-assessments that develop student metacognition, responding to teachers' observations on the importance of students being able to "organise their ideas by expressing them and solving problems" (DGT8).

Component 4: Development of cross-curricular skills

The model recognises that preschool education should promote the comprehensive development of students. Based on the principles identified by Gaibor (2023) and the observations of participating teachers on the importance of "artistic activities" (DGT9), strategies are incorporated that simultaneously promote cognitive, socio-emotional, communicative and motor development.

Gamified activities should be designed to promote skills such as collaborative work, creative problem solving, effective communication and emotional self-

regulation, skills that teachers identified as fundamental when they expressed the importance of creating "a dynamic, creative environment" (DGT1) that strengthens "the comprehensive development of children" (DGT2).

Operational structure of the proposal

Phase 1: Contextualised gamified planning

Planning should begin with the identification of specific learning objectives and their translation into appropriate game mechanics, considering the individual characteristics of the student body identified by teachers. As one participant stated: "Get to know the student, stimulate curiosity with activities" (DGT3), establishing the importance of personalisation in the design of gamified experiences.

During this phase, the main narratives based on student interests are established, the most appropriate game mechanics are selected according to the available resources ("use various resources: computer, images, games" - DGT4), and monitoring and evaluation strategies are planned to allow for flexibility and adaptation.

Phase 2: Interactive implementation

Implementation requires teachers to take on the roles of facilitators and connectors, actively participating in gamified experiences. The study's findings reveal that teachers value "active student participation" (DGT5) and the importance of maintaining "interaction with students through music, games, and stories" (DGT6).

During implementation, a balance must be maintained between structure and flexibility, allowing students to explore and experiment while receiving appropriate guidance, as suggested by Prieto-Andreu et al. (2022) in their analysis of the relationship between gamification and motivation in education.

Phase 3: Evaluation and continuous feedback

Assessment should be integrated naturally into gamified activities, avoiding interruptions that affect student immersion. Participating teachers emphasised the importance of "building on children's prior knowledge" (DGT7) and "raising questions and then resolving them" (DGT8), establishing assessment as a continuous process of construction.

Feedback should be specific, constructive and improvement-oriented, using visual, narrative and playful resources to communicate assessment results in an understandable and motivating way, as suggested by teachers when mentioning the use of "audiovisual resources, texts with related activities" (DGT9).

Phase 4: Reflection and continuous improvement

The model includes systematic reflection processes involving teachers, students and families. Participating teachers stated that "all training provided is welcome" (DGT1), highlighting the importance of continuous training and reflection on teaching practice.

Teacher reflection should include analysis of their own teaching practice, identification of professional skills developed, and the formulation of personal improvement plans, following the recommendations of Márquez-Ramírez & Angulo-Armenta (2024) on the importance of continuous updating in educational gamification.

Pedagogical implications of the proposal

Transformation of teaching practices

The results of the study reveal that the implementation of the gamified teaching model involves significant transformations in traditional teaching practices. Participants expressed the need to develop new skills, as one of them stated: "I would need help understanding how to adapt gamification concepts to my curriculum" (DGT8). This need is consistent with the findings of Montaño & Enríquez (2022), who identify that the most effective teaching strategies in early childhood education are those that constantly adapt to emerging student needs.

The participating teachers highlighted the importance of continuous training, stating that "all the training provided is welcome to help the students' learning process" (DGT7). This attitude towards professional learning is essential for developing skills in gamified instructional design, creating engaging educational narratives, and evaluating the effectiveness of gamified strategies.

Pedagogical transformation also involves changes in the spatial and temporal organisation of the classroom. The teachers in the study highlighted the importance of "varying teaching methods" (DGT6) and using "various resources: computers, images, games" (DGT4), which requires flexible learning

environments that allow for different modes of interaction and movement activities.

Development of professional teaching skills

The analysis revealed that teachers need to develop specific skills in educational gamification. According to Lardín et al. (2023), the effective integration of technology into gamified processes requires an understanding of both the technical possibilities and the pedagogical implications. Study participants expressed interest in "learning about the subject, receiving training" (DGT2), highlighting the need for specialised training.

Educators must develop skills to facilitate playful experiences, mediate conflicts during play, and communicate effectively with students immersed in gamified narratives. As one participant stated: "I apply them with the intention of creating a dynamic, creative environment and generating excitement in students for new learning" (DGT3), highlighting the importance of maintaining a balance between pedagogical authority and playful participation.

Impact on student development

The gamified teaching model has significant implications for the comprehensive development of preschool students. Participating teachers observed that "the impact on children can be seen when they are able to organise their ideas by expressing them and solving problems" (DGT6), which is consistent with the findings of Guaman et al. (2024) on the contribution of play to student cognitive development.

In the cognitive domain, teachers reported that gamification promotes the development of executive functions. Game mechanics require students to keep multiple variables in mind and adapt their strategies according to circumstances, as one teacher observed: "Children are able to learn and solve everyday problems, allowing them to enhance their skills" (DGT4).

Socio-emotional development is enhanced by the opportunities for collaborative interaction that are characteristic of gamified activities. Teachers emphasised the importance of "teamwork" (DGT5) and "playful-educational activities" (DGT1), which allow students to learn to negotiate, share and resolve conflicts in safe play contexts.

Changes in educational assessment

The proposed model transforms traditional assessment approaches into continuous, formative gamified assessment. Participating teachers expressed the importance of "motivating and valuing their efforts" (DGT7), which aligns with the principles of gamified assessment that provide constant feedback on student progress.

Gamified assessment tools provide richer and more contextualised information about student performance. As one teacher stated: "Starting from the children's prior knowledge, generating questions and then resolving them with information and ideas that we contribute in the classroom" (DGT8), demonstrating an assessment approach that goes beyond the measurement of declarative knowledge towards the assessment of applied skills.

Self-assessment and co-assessment take on central importance in the gamified model. Students develop metacognitive skills that allow them to reflect on their own learning, as teachers observed when they mentioned that children are able to "organise their ideas by expressing them" (DGT6), contributing to the development of self-regulation and personal responsibility.

Limitations of the proposal

This study has limitations related to its scope and specific context. The research was conducted in a single educational institution in Bucaramanga, Colombia, which may limit the generalisation of the results to other geographical and sociocultural contexts. As recognised by Pazmiño-Arcos et al. (2024), sociocultural characteristics significantly influence the effectiveness of educational strategies, so the proposed model requires appropriate contextual adaptations.

The sample of nine teachers, although appropriate for a phenomenological study, represents a specific group of educators with particular characteristics in terms of training and experience. According to Ramírez-Benavides (2024), the effectiveness of gamified tools may vary according to teacher competencies and attitudes, suggesting the need for studies with a greater diversity of participants.

The qualitative approach of the study, although appropriate for understanding teachers' experiences and perceptions, does not allow causal relationships to be

established between the implementation of the gamified model and specific student learning outcomes. As Screpnik et al. (2023) point out, evaluating the impact of gamification requires research designs that combine qualitative and quantitative methods.

Impact on student development

The proposed gamified teaching model has significant implications for the comprehensive development of preschool students. Based on the results of Guaman et al. (2024), the systematic implementation of gamified strategies is expected to contribute to cognitive, socio-emotional, communicative and motor development in an integrated manner.

In the cognitive domain, gamification promotes the development of executive functions such as sustained attention, working memory, cognitive flexibility, and inhibitory control. Game mechanics require students to keep multiple variables in mind, adapt their strategies according to circumstances, and regulate their impulses to achieve long-term goals.

Social-emotional development is enhanced by the opportunities for collaborative interaction that characterise gamified activities. Students learn to negotiate, share, resolve conflicts, and celebrate collective achievements. Gamified narratives also provide safe contexts for exploring emotions, developing empathy, and building personal identity.

Changes in educational assessment

The proposed model radically transforms traditional assessment approaches. Gamified assessment is characterised by its continuous, formative, and motivating nature. Students receive constant feedback on their progress, allowing them to adjust their learning strategies in real time.

Gamified assessment tools provide richer and more contextualised information about student performance. Rather than measuring declarative knowledge alone, these tools assess applied competencies, problem-solving skills, and the ability to transfer knowledge to new contexts.

Self-assessment and co-assessment take on central importance in the gamified model. Students develop metacognitive skills that allow them to reflect on their own learning, identify strengths and weaknesses, and set personal goals for

improvement. This evaluative autonomy contributes to the development of self-regulation and personal responsibility.

Limitations of the study

This study has limitations related to its theoretical nature. Although the proposed model is based on empirical evidence available in the specialised literature, it requires practical validation through implementation and evaluation processes in real contexts. The effectiveness of the model must be verified through experimental research that measures its impact on specific learning and development variables.

The literature review was limited to sources available in Spanish, which may have excluded relevant research published in other languages. This limitation suggests the need to broaden the analysis to include international literature that could enrich the understanding of the phenomenon studied.

The specific cultural context of the research analysed (mainly Latin American) may limit the generalisation of the results to other geographical and cultural contexts. Sociocultural characteristics significantly influence the effectiveness of educational strategies, so the proposed model requires appropriate contextual adaptations.

Considerations for implementation

The successful implementation of the gamified teaching model requires favourable institutional conditions adapted to the reality of the Colombian education system. Educational institutions must provide appropriate technological resources that take into account the common budgetary constraints in the national education sector, flexible physical spaces that can be adapted with local resources, and sufficient time for the planning and development of gamified activities. In contexts where technological resources are limited, teacher creativity and the use of local and recyclable materials should be prioritised to create effective gamified experiences.

Teacher training is a fundamental requirement for effective implementation, considering that many educators in the country have not had access to specialised training in gamification. Educators need training opportunities in educational game design, the use of appropriate technologies available in the

national context, and gamified assessment strategies. This training should be ongoing and accompanied by mentoring and institutional support processes that take into account the working and economic realities of Colombian teachers.

Family participation is another determining factor for the success of the model, especially relevant in a society where the extended family plays a central role in children's education. Families must understand the principles and benefits of educational gamification in order to consistently support the processes developed in the classroom. Communication and family training strategies are needed that respect the different educational levels of caregivers and use communication channels that are accessible to different socioeconomic contexts.

Ethical considerations

The implementation of gamified strategies in preschool education must consider ethical aspects related to the manipulation of student motivation, which are particularly relevant in contexts where socioeconomic conditions can influence child vulnerability. It is important to ensure that game mechanics promote genuine intrinsic motivation and not dependence on external rewards that may affect the development of personal autonomy, considering that many children in the national context may come from environments where immediate gratification is not always possible.

Equity in access to gamified experiences is another fundamental ethical consideration in the context of a country with marked socioeconomic inequalities. All children should have equal opportunities to participate in gamified activities, regardless of their individual characteristics, family contexts, or technological capabilities. Inclusion strategies are required to ensure universal participation and prevent exclusion based on access to specific technologies or materials.

Student privacy and data protection must be considered when using digital technologies in gamified processes, which is especially important in a context where personal data protection regulations in education are still developing. Institutions should implement appropriate protocols to protect students' personal information and ensure the ethical use of educational technologies, taking into account national regulations and the fundamental rights of minors.

CONCLUSION

The development of a gamified teaching model to promote meaningful learning in preschool students responds to contemporary pedagogical needs identified in the specialised literature. The synthesis of the research analysed demonstrates that gamification, when implemented appropriately, can positively transform educational processes at the early level.

The proposed model coherently integrates principles of meaningful learning with game mechanics appropriate for preschool development. Its four fundamental components (design of contextualised playful experiences, implementation of educational game mechanics, gamified formative assessment, and development of cross-curricular skills) provide a comprehensive structural framework for pedagogical practice.

The pedagogical implications of the model transcend the implementation of specific techniques and demand profound transformations in teachers' conceptions of teaching, learning, and assessment. Educators must develop new professional competencies that enable them to design, implement, and evaluate effective gamified experiences.

The theoretical results suggest that the systematic application of the model can contribute significantly to the comprehensive development of preschool students. Students exposed to structured gamified methodologies are expected to show higher levels of motivation, engagement, knowledge retention, and cross-cutting skills development.

The limitations identified in the study indicate the need for empirical research to validate the effectiveness of the model in real contexts. Experimental studies are needed to measure the specific impact of each component of the model on clearly defined learning and development variables.

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CONFLICT OF INTEREST

There is no conflict of interest with individuals or institutions linked to the research.

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