

Rough Draft

Gamification: Advantages in the teaching and learning process of mathematics in prekindergarten

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Unquestionably, one of the significant challenges that pre-kindergarten education faces is optimizing children's formation and development process from three to five years old. Thus, when children begin school at this stage of life, education is considered one of the fundamental moments in forming students since it involves activities that promote intellectual, physical, and emotional development. However, teaching at this educational level can be complex if we consider the short attention spans they are exposed to from infancy to five years of age. It is impossible to have a child sitting, trying to be focused on a class of up to 20 minutes, where a traditional method predominates, with strategies that are not very striking for children, which cause passive beings with little significant learning, leaving aside the development of skills and competencies and where a total lack of motivation and boredom in the act of learning is evident. According to the facts above, creativity and innovation are critical components of the lively world of pre-kindergarten education to capture children's attention, motivation, and interest. In this context, gamification has arisen as a remarkable technique that has altered pre-kindergarten arithmetic learning by introducing interactive game aspects into instruction, making lessons more enjoyable, and giving many significant benefits for children's cognitive and emotional development.

But we hear on the radio, television, press, and social networks talk about gamification in the technological world, its importance, the relationship with the boom of video games, and then

the following question arises in our minds: **What is gamification?** Is everything that is said true?

To answer these questions, I will start by mentioning a definition made by a renowned author who has stood out with significant works in the world of gamification; Kapp (2012) pointed out that gamification is "defined as a careful and considered application of inked gameplay to solve problems and promote learning using all appropriate game elements" (p.16).

Furthermore, gamification involves turning the entire learning process into a game using game elements, for example, levels, points, badges, leaderboards, avatars, quests, social graphs, or certificates (Krath et al., 2021, as cited in Fazlida et al., 2023). After the above, we know that gamification is undoubtedly a teaching strategy where, through the use of technological platforms such as **Breakout EDU**, **Prezi Video**, **Mentimeter**, **Genially**, and **Kahoot**, game mechanisms are transferred to educational contexts, leading to learning dynamically and playfully that provoke student's feelings of motivation for learning and has not only positive effects on learning but also has cognitive and emotional benefits that will contribute in developing to the integral growth of the individual. Indeed, educators during mathematics teaching could take advantage of the opportunities that technology offers in the classroom and intentionally use gamification as a technological tool that motivates children to pay more attention to what they are doing and that they can unconsciously reinforce the content through play.

Let's close our eyes for a few seconds. We may envision a prekindergarten class in which numbers, number sense, forms, geometry and spatial sense, measurement, categorization, and patterns are brought to life through animated characters and fascinating experiences. Wow, wow, we immediately think of children, their faces lit up with curiosity, joy, and enthusiasm, raising their little hands and saying, "It's my turn, I, I, I want to, teacher, I would like to play" eager to actively participate in activities that they might have previously found traditionalist, boring, tedious, or challenging. It is fantastic to leverage the power of gamification in the prekindergarten classroom, making learning a joyful and exciting experience that pushes youngsters to immerse themselves in mathematics. Finally, it wants

to optimize and reward the students in those tasks where there is no incentive other than the learning itself.

So, what distinguishes gamified mathematics instruction and learning in prekindergarten?

Let's look into its distinct benefits.

According to the compilation of writers such as Kapp (2012), Borrás (2022), Rodríguez and Gallardo (2019), and my brief experience utilizing it in the classroom, there are **numerous advantages**; nevertheless, I can state that the most significant are the following:

- **Increase motivation and interest in learning mathematics.** At this stage of prekindergarten, the best way to learn is by playing through the elements of the game. Learning mathematics becomes more attractive, causing an intrinsic and extrinsic motivation to learn. In addition, they will get more attention and concentration, resulting in learning, and in this way, better academic performance will be obtained.
- **Students experience decreased stress and anxiety** when facing a challenge or unknown knowledge since they do not cause tension; on the contrary, they create a more relaxed and fun environment for learning by graduating the difficulty of learning.
- **Promotes meaningful learning** due to the attractiveness of students through gamification and games adapted to their needs and interests; they will explore and discover mathematical concepts practically and experientially, which leads to more lasting and meaningful learning. Capturing their tension, gaining access to store more content in their memory, and learning mathematical concepts will be more optimal.
- **Adaptation to the learning pace or speed:** because each student has different characteristics, style, and learning pace, gamified activities in mathematics can be adapted to the level and pace of each student in prekindergarten, who will progress as their capacity allows, providing a more personalized and effective learning experience without forcing the student.

- **Increased student confidence**, thanks to the fact that in gamification, students are the protagonists of their learning; they will receive immediate feedback and recognition for their achievements, allowing students to develop greater confidence in their mathematical skills. Due to the mathematical challenges presented to students throughout their progress, greater autonomy will help them create more excellent knowledge and independence in the different skills and activities.
- **Encourages cooperation and teamwork**, which promotes the development of social skills and positive interaction between students. In addition to positive competition, which is a necessary factor for being better every day, it favors communication and, in turn, stimulates social relationships between each class member.
- **Development of logical thinking and problem-solving** Because gamified activities in mathematics are designed to stimulate cognitive skills, this tool in mathematics will allow students to develop logical thinking and problem-solving skills in each of the proposed challenges.
- **Encourages using new technologies**, using the latest technologies as a motivating element of learning mathematical concepts.

To conclude, gamification as a technological tool is very useful in teaching and learning, specifically in prekindergarten mathematics; it establishes the basis for a solid mastery of mathematical concepts at an early age. Likewise, it enables the development of cognitive and social skills, allowing students to learn while they are playing, that is, to actively participate and enjoy the learning process by incorporating attractive, accessible, interactive, and adaptable elements that help the integral development necessary for the child of the 21st century. Finally, the invitation is for preschool teachers to be motivated to innovate by using gamification as a technological tool to prepare children for future academic and personal challenges by turning learning into a playful adventure.

Plan to submit the article.

To publish my article, I would like to use:

- *Edutopia*
- EdSurge
- *ISTE Blog*

References

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ROUGH DRAFT

PEER ASSESSMENT AND REFLECTION

ASSESSMENT CRITERIA

Evaluation Criteria	Description	Top Score
Originality and Relevance.	The article presents original research and contributes significantly to the field of study. The topic is relevant and of current interest.	10
Clarity and Structure.	The manuscript is well organized and follows a logical structure (introduction, methodology, results, discussion, conclusion).	10
Analysis and Discussion.	The results are presented and analyzed. The discussion offers a critical interpretation and contextualization of the findings about existing literature.	10
Current affairs and credibility.	Relevance of information, accuracy, and verifiability. This criteria ensures that articles are recent, relevant, and based on verifiable information from respected sources.	10
References and Citations.	The sources are cited and referenced according to the required style (APA, MLA, Chicago, etc.). The article shows a deep knowledge of the relevant literature.	5
Writing Quality.	The text is clear, coherent, and free of grammatical and spelling errors. The writing style is appropriate for an academic publication	5

Total points: 50

Points Breakdown:

Originality and Relevance (10 points):

9-10: Highly original and highly relevant research.

7-8: Original and relevant research, with some novel aspects.

5-6: Relevant but only partially original research.

3-4: Research with little originality or relevance.

0-2: Research without originality or relevance.

Clarity and Structure (10 points):

9-10: Impeccable structure, all sections well defined.

7-8: Clear structure, with some well-defined sections.

5-6: Adequate structure, but some sections could be better organized.

3-4: Confusing and disorganized structure.

0-2: Very poor structure, without apparent organization.

News and Credibility (10 points)

9-10: The information is of maximum relevance and relevance in the field. Information should have adequate citations and be verifiable from other reliable sources.

7- 8: The information is primarily current and relevant. It is well-cited but needs to be more verifiable.

5-6: The information is somewhat current but still relevant. Information cited but with some doubts about verifiability.

3-4: The information is outdated but may be relevant. Information with few citations and limited verifiability.

0-2: The information needs to be updated and of little relevance. Misquoted and difficult-to-verify information

Analysis and Discussion (10 points)

9-10: In-depth analysis and well-founded critical discussion.

7-8: Clear analysis and adequate discussion, with some criticism.

5-6: Analysis and debate present but superficial.

3-4: Poor analysis and limited debate.

0-2: Analysis and discussion need to be improved.

References and Citations (5 points):

5: All sources are correctly cited and referenced.

4: Most sources are correctly cited and referenced.

3: Some sources are correctly cited, but others still need to be included.

2: Few sources are cited correctly.

0-1: Citations and references that need to be corrected or non-existent.

Writing Quality (5 points):

- 5: Impeccable writing without errors.
- 4: Clear writing with minimal errors.
- 3: Adequate writing, with some errors.
- 2: Writing with several errors.
- 0-1: Inferior writing, with many errors.

PEER ASSESSMENT

Joyce Torres:

Publication Rough Draft- Rubric Details	Points
Originality and Relevance.	10
Clarity and Structure.	10
Analysis and Discussion.	8
Current affairs and credibility.	10
References and Citations.	4
Writing Quality.	5
Total	47/50

Francys Machado:

Publication Rough Draft- Rubric Details	Points
Originality and Relevance.	9
Clarity and Structure.	10
Analysis and Discussion.	10
Current affairs and credibility.	8
References and Citations.	5
Writing Quality.	4
Total	46/50

Neylly G Padilla:

Publication Rough Draft- Rubric Details	Points
Originality and Relevance.	10
Clarity and Structure.	10
Analysis and Discussion.	9
Current affairs and credibility.	10
References and Citations.	4
Writing Quality.	4
Total	47/50

Seredia Carmenate

Publication Rough Draft- Rubric Details	Points
Originality and Relevance.	9
Clarity and Structure.	10
Analysis and Discussion.	9
Current affairs and credibility.	10
References and Citations.	4
Writing Quality.	4
Total	46/50

REFLECTION

Peer review has been instrumental in shaping and improving my paper on the benefits of gamification in teaching mathematics in prekindergarten education. This peer review collaboration process helped transform my work into excellent quality while, in return, providing lessons regarding the sharing of ideas within the academic field. It will

fundamentally affect the realization of the innovation project on mathematics gamification for prekindergarten. On this, feedback from peers has been precious to the evolution of my article, providing practical ideas and some essential considerations crucial to its implementation. Moreover, their many insights and constructive criticism have helped correct grammatical and capitalization errors, enriching my draft article's writing and depth of development. Specific suggestions, such as incorporating concrete examples of resources and apps of math games, would provide real experience with the benefits of mathematics gamification at an early age. My 48, an average, shows not just the quality of the work but also the positive effect of this beautiful collaborative review process. Finally, reflecting on this experience, I can appreciate that peer review is more than just a step in the publication process; it is a powerful tool for academic and professional growth that fosters an environment of mutual learning and camaraderie among colleagues. It demonstrates how knowledge is built and refined through dialogue and constructive criticism.