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A STUDY EXPLORING THE IMPLEMENTATION OF AI DRIVEN GAMIFICATION IN UG & PG EDUCATIONAL SETTINGS

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Abstract: This study explores the implementation of AI-driven gamification tools in undergraduate (UG) and postgraduate (PG) educational environments. Data was collected through a field survey of 93 educators, aiming to investigate the frequency of AI tool usage, the primary purposes for their use, and the challenges educators face, particularly in terms of infrastructure and resource availability. The study utilized Jamovi for descriptive analysis and conducted a Chi-Square test to test the hypotheses. The results reveal that a significant proportion of educators (73.12%) use AI-driven gamification tools occasionally, with Kahoot! being the most widely used platform. However, challenges related to institutional infrastructure and resource availability remain prevalent, with 61% of educators reporting infrastructure-related difficulties and 77% indicating resource constraints. The research further examines the relationship between institutional infrastructure, administrative support, and educator confidence. The findings highlight the need for improved institutional support to ensure the effective use of AI-driven gamification tools and enhance the overall teaching experience.
Keyword: AI-driven gamification, Educator confidence, Institutional Infrastructure, administrative support, teaching experience

1. INTRODUCTION

The integration of artificial intelligence (AI) into educational settings has gained significant attention in recent years, with AI-driven gamification emerging as a promising tool for enhancing learning outcomes. AI-driven gamification tools combine artificial intelligence with game mechanics to create dynamic, interactive, and engaging learning environments that have the potential to increase student motivation, foster collaboration, and improve overall educational experiences. These tools have been particularly effective in making learning more interactive, providing instant feedback, and promoting active participation among students. Platforms like Kahoot!, Quizizz, and Classcraft are widely used in both undergraduate (UG) and postgraduate (PG) educational settings, making them central to modern teaching strategies.

However, despite the growing popularity of these tools, the implementation of AI-driven gamification in educational environments is not without its challenges. Many educators, particularly in higher education, face significant barriers to the effective use of these tools, such as limited access to essential resources, insufficient infrastructure, and lack of adequate administrative support. These challenges often hinder the full potential of AI-driven gamification tools, preventing them from being utilized to their maximum capacity. Moreover, while some educators have readily embraced these technologies, others remain skeptical, primarily due to concerns about the reliability and sustainability of the technological infrastructure, as well as the need for professional development to effectively integrate these tools into their teaching practices.

The aim of this study is to explore the current landscape of AI-driven gamification tools in UG and PG educational settings, with a focus on understanding how frequently these tools are used, the primary purposes for their use, and the specific challenges faced by educators. Additionally, the research seeks to investigate the relationship between institutional infrastructure, administrative support, and educator confidence, to determine the key factors that influence the adoption and effective use of these tools. By gathering insights from educators who use or are aware of AI gamification tools, this study aims to highlight the institutional support structures required to enhance the implementation of these technologies and improve learning outcomes.

The findings will assist educators, administrators, and policymakers in developing strategies to foster a more supportive environment for the effective use of AI-driven gamification tools, ultimately enhancing student engagement and learning experiences.

2. METHODS

This study investigates the implementation of AI-driven gamification tools in undergraduate (UG) and postgraduate (PG) educational settings. A quantitative research design was applied, with a field survey used to collect data from 93 educators. The survey aimed to explore the frequency of AI tool usage, the primary purposes for their use, the challenges faced by educators, and the relationship between institutional infrastructure, administrative support, and educator confidence. The survey focused on various aspects such as the most commonly used AI tools, the frequency of their use (daily, weekly, occasionally), and the primary purposes for their application (e.g., quizzes, student engagement, collaborative learning). Additionally, it sought to assess challenges like resource constraints and infrastructure issues. Jamovi was used for descriptive analysis, and a Chi-Square test was applied to test the research hypotheses. The study specifically tested the relationship between institutional infrastructure and the frequency of AI tool usage, and the relationship between administrative support and educator confidence. This methodology provided a comprehensive view of the current state of AI-driven gamification tools in educational settings, as well as insights into the support structures required for their successful implementation. The findings aim to help improve AI adoption and the overall teaching experience in UG and PG education.

Objectives of the Study
1. To explore the current state of AI-driven gamification tools in educational settings
2. To investigate the challenges faced by educators in implementing AI-driven gamification
3. To identify institutional settings and support structures required for successful implementation of AI-driven gamification

Research Hypotheses
1. There is a significant relationship between Institutional Infrastructure and Frequency of AI Gamification Tool Usage
2. There is a significant relationship between administrative support and educator confidence

3. RESULTS AND DISCUSSION

Figure 1: Frequency of AI-driven gamification tool usage
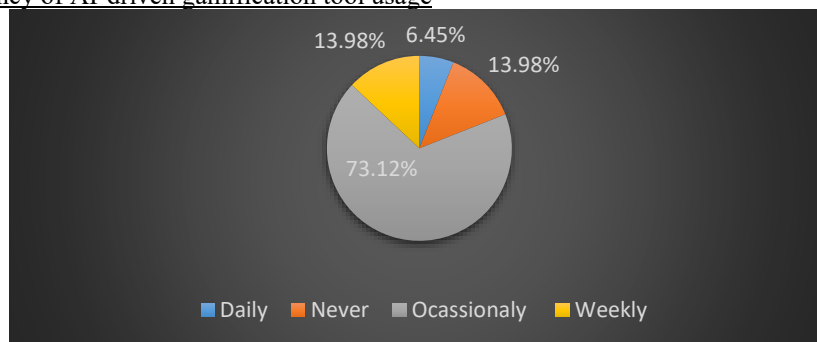
(Source Primary Data)

The majority of educators (73.12%) use AI-driven gamification tools occasionally, indicating that while AI tools are commonly used, they are not integrated into daily practices for most educators. A small percentage of educators use these tools daily (6.45%), which suggests that there is limited frequency of daily engagement with these tools. Only 13.98% of educators use the tools weekly, and another 13.98% never use them at all. This shows that regular use of AI tools is relatively low in some educational settings.

Figure 2: Most commonly used AI-Driven Gamification Tools
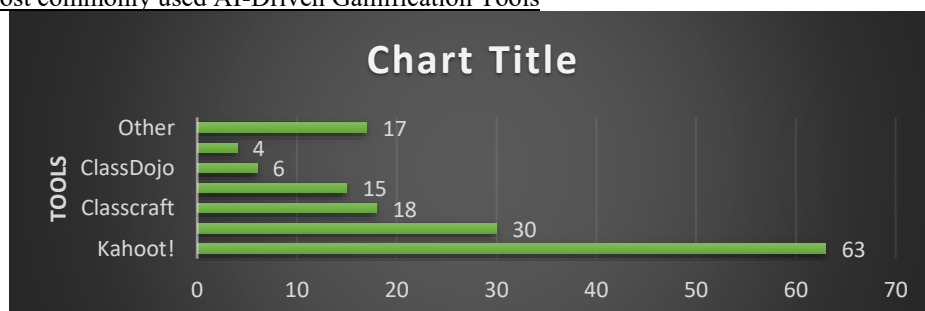
(Source Primary Data)

Kahoot! stands out as the most popular AI-driven gamification tool, with 63% of educators using it. This indicates that Kahoot! is the dominant platform in educational settings for gamification. Other tools like Classcraft, Quizizz,

and Blooket are also popular, suggesting a variety of tools are being utilized, but none seem to surpass Kahoot! in popularity.
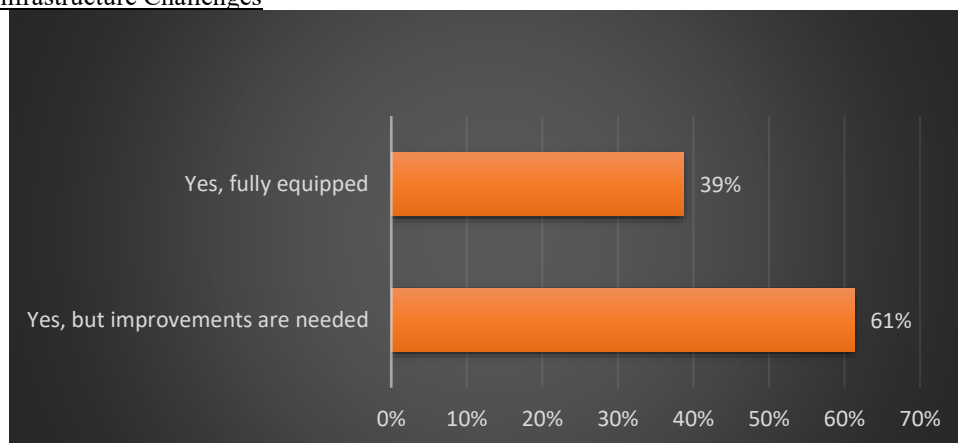
Table no 1 Primary use of AI-driven gamification tools

Purpose	Total
Quizzes and assessments	58
Collaborative learning activities	18
Student engagement and motivation	17
Other	7

(Source Primary Data)

Quizzes and assessments are the most common use of AI-driven gamification tools, accounting for 45% of the use cases. This suggests that AI tools are primarily seen as a way to enhance assessment and quiz activities. Student engagement and motivation is the second most common purpose (26%), reflecting that these tools are also frequently used to increase student participation and engagement. Collaborative learning activities account for 19% of the use, suggesting that AI tools are used to a lesser extent for fostering collaboration among students. Other purposes, though a smaller group (7%), indicate that AI tools are also being used for a range of other educational purposes that do not fit neatly into the categories above.

Figure 3: Infrastructure Challenges

(Source Primary Data)

A significant 61% of educators report facing infrastructure issues, indicating that many institutions are struggling to provide adequate resources for the effective implementation of AI-driven gamification tools. While most institutions have some equipment in place, 39% of educators indicate that they work in fully equipped facilities, suggesting that a majority of schools or institutions could benefit from further investments in technology to enhance the use of AI tools.

Figure 4: Resource Availability
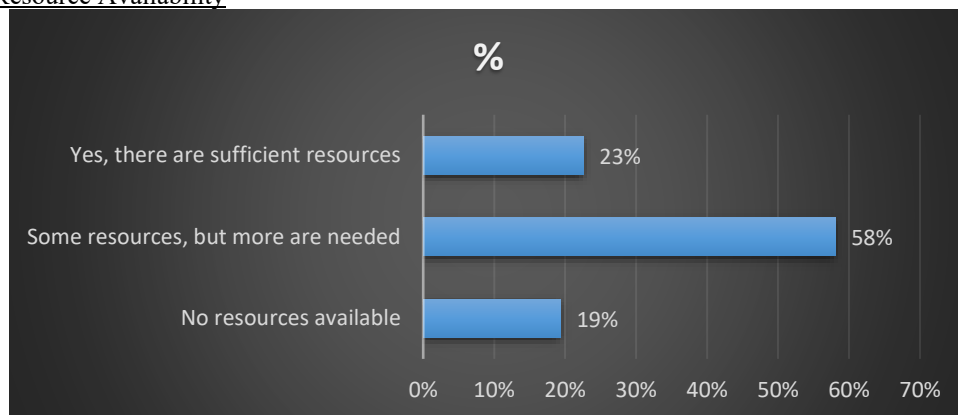
(Source Primary Data)

77% of educators face resource constraints, highlighting that a large proportion of educators do not have enough resources to fully implement AI-driven gamification tools. This may involve limitations in hardware, software, or internet connectivity. The majority of educators report having "some resources, but more are needed", suggesting that even though tools might be available, they may not be sufficient for effective usage. Only a small percentage

of educators have access to sufficient resources, pointing to a gap in resource availability that could be hindering more widespread and effective use of AI tools in education.

Hypothesis 1 - There is a significant relationship between Institutional Infrastructure and Frequency of AI Gamification Tool Usage

The chi-square test results indicate a significant relationship between institutional infrastructure and the frequency of AI usage in teaching. The p-value of approximately 0.0036 suggests that we can reject the null hypothesis, which states that there is no relationship between these two variables.

Chi-square 13.5188

p-value – 0.0036

Degree of freedom – 3

Table no. 2 Institutional Infrastructure vs Frequency of AI tool usage

Institutional Infrastructure vs Frequency of AI tool usage	Daily	Never	Occasionally	Weekly
Yes, but improvements are needed	0	6	45	6
Yes, fully equipped	6	6	18	6

The contingency table shows the distribution of responses regarding institutional infrastructure and the frequency of AI usage, which helps visualize the relationship.

Figure no 4 Institutional Infrastructure vs AI usage frequency
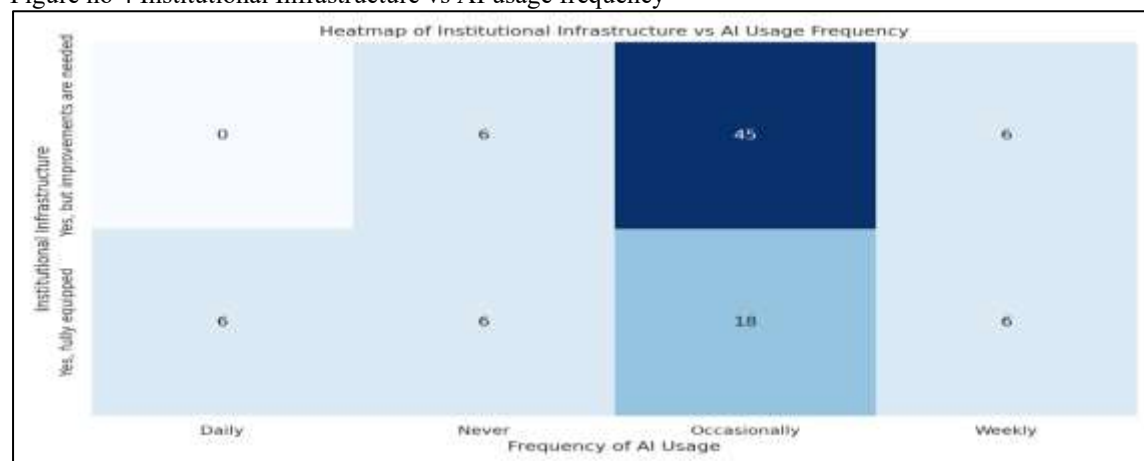
Hypothesis 2 – There is a significant relationship between administrative support and educator confidence

The chi-square test results indicate a significant relationship between administrative support and the educator confidence. The p-value of approximately 0.0 suggests that we can reject the null hypothesis, which states that there is no relationship between these two variables.

Chi-square 53.8895

p-value – 0.0

Degree of freedom – 16

Table no 3: Administrative support vs educator confidence

Administrative Support vs Educator Confidence	1	2	3	4	5
1	0	3	3	0	3
2	0	0	6	3	0
3	3	3	30	15	6
4	6	0	0	6	3
5	0	0	0	3	0

The study also found a strong relationship between institutional infrastructure and the frequency of AI tool usage, suggesting that well-equipped institutions are more likely to use these tools frequently. The Chi-Square test confirmed a significant relationship, with a p-value of 0.0036. Moreover, the study revealed a significant relationship between administrative support and educator confidence in using AI gamification tools. Educators who received higher levels of administrative support were more confident in incorporating AI tools into their teaching, with those at institutions with stronger support reporting higher confidence levels. The Chi-Square test for this relationship yielded a p-value of 0.0, further reinforcing the importance of administrative backing.

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In conclusion, while AI-driven gamification tools are being used with varying frequency, challenges related to infrastructure and resources limit their full potential. Enhancing institutional infrastructure and increasing administrative support could significantly improve the usage and effectiveness of these tools in educational settings.

5. ACKNOWLEDGMENT

6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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