

A COMPARATIVE ANALYSIS OF GAMIFIED EDUCATIONAL APPLICATIONS FOR ENHANCING CLASSROOM ENGAGEMENT

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Abstract: *In the era of Education 4.0, transitioning to Education 5.0, the use of gamified educational applications has become increasingly popular to enhance student engagement, motivation, and learning outcomes. Traditional teaching methods are now often supplemented with digital tools that turn passive learning into interactive experiences. This study was designed to analyze and compare 44 educational applications commonly used in classroom settings, with a focus on their gamification features, usability, and educational impact. The objective of this study is to help educators select the most effective tools to enhance student engagement and support meaningful learning experiences. The study employed a qualitative descriptive review of each application, focusing on its features, functions, and significance in teaching and learning. The findings indicated that many applications effectively incorporated gamification elements such as points, leaderboards, challenges, and real-time feedback to*

boost student motivation and engagement. Others emphasized features that support creativity, collaboration, and classroom management, offering diverse approaches to enhance the teaching and learning experience. The comparison also highlighted the importance of features like offline access, cross-platform compatibility, and reporting tools for tracking student progress. While most applications offer basic functionalities for free, many require paid subscriptions to access advanced features. This study provides practical insights for educators, equipping them with the knowledge to align technology use with pedagogical goals and student needs. By understanding the distinct features and strengths of each tool, educators can create learning environments that support 21st-century skills, active learning, and a positive classroom culture across various educational settings.

Keywords: *educational mobile apps; mobile learning; educational technology; digital educational tools; app-based learning*

Introduction

As Education 4.0 and 5.0 are critical developments in the evolution of educational systems, each of them stands on the shoulders of the other predecessors. Accordingly, the central theme of education paradigm 4.0 is the use of new technologies in the face of the needs of Industry 4.0, which prepares students for the labor market that evolves rapidly. However, Education 5.0 stands out and emphasizes humans' sense with the incorporation of these technological innovations. This change is an effort to create an inclusive, but sustainable learning environment that cherishes technological advancement, while not losing focus on the development of important human skills (Pratyusha et al., 2025; Rivadeneira, F., et al., 2025)

Educational gaming apps are a compelling option for enhancing student motivation, promoting engagement (Takbiri, et al., 2023), and improving learning outcomes in various educational settings (da Silva Pontes, et al., 2024). These dynamic resources bring the learning journey to life, inspiring students and enabling them to achieve as much as they can in order to reach that potential there are significant roadblocks such as being able to afford to develop them, got privacy and data security standards which would need to be addressed and then the value of getting comprehensive and systematic research, which is important. Overcoming these obstacles is necessary if the educational potential of gamification is to be fully realised.

Literature Review

Education 4.0 and 5.0

Education 4.0 is a vision for education such that it can meet the challenges of the Industry 4.0 (Yeoh, H. B, et al., 2025). It highlights technology integration and cutting-edge pedagogical practices to get students ready for the future of work. All these are the main elements of Education 4.0 such as, technology use (Huk, T., 2021), skills development (López, H. A., et al., 2021), personalized learning experiences (Evain, et al., 2024), collaborative education and creative pedagogies (Rienties, et al., 2023). On the other hand, Education 5.0 is based on the ideals of education 4.0 with more emphasis to human centered and sustainable education. The objective is a more inclusive, fair and sustainable society that balances technological development with a concern for the well-being of our fellow human beings. Core tenants of Education 5.0 encompass human-centered (Pratyusha et al., 2025), technology and human synergies, inclusion and equity and future of work ready skills (Ciolacu, 2023).

Gamified Educational Applications

Gamified learning applications are those that incorporate gameful design to promote student motivation and engagement in the learning context. The benefits include greater student engagement, motivated by the provision of points and rewards that are part of the application (Takbiri, et al., 2023). It also enhances academic performance and supports individual learning, allowing students to self-monitor their progress (Silva, I., et al, 2022). It also helps make courses more engaging and fun for students (da Silva Pontes, et al., 2024). However, several challenges and concerns are associated with creating gamified educational applications. The extensive development work required in terms of costs and resources can have a significant impact on development. Data protection of students is an important aspect that needs to be discussed. Additionally, there is scant evidence of the long-term educational successes of gamification. Finally, gamification elements should be carefully planned to meet the needs of various learners, including those with diverse learning styles and personality types, in order to be inclusive and effective (Šego, A. and M. Gakić, 2024; Dichev. C. and D. Dicheva, 2017) .

Gamification is implemented across various educational levels, yielding positive results. In university education, it is widely adopted and has brought about a significant improvement in student engagement and learning outcomes. Gamification is less common in primary and secondary education, but it is especially successful when adopted, for example, to motivate students, particularly in the STEM field. Moreover, in distance learning, these gamified approaches can overcome the issues of motivation and involvement faced by students, thereby making online learning more interactive and more feasible for both parties (Franco, D. C., 2022; Vrcelj, A., et al, 2023).

Methodology

The methodology employed in this study is a comparative content analysis, which combines content analysis, qualitative descriptions and comparative analysis of the usage of each educational application tool. Its objective is to provide descriptions of every app. This method enables the identification of differences among various applications through comparison. The methodology of this study is illustrated in Figure 1, which consists of four phases. Phase 1 involves searching for relevant gamified education apps used for educational purposes on the Google Play Store. Phase 2 includes app features and characteristics. The second stage involves exploring the content of each app and breaking it down into its features. Phase 3 involves comparing and evaluating the technical aspects of teaching and learning methods. Lastly, in Phase 4, app synthesis and classification are conducted based on their features.

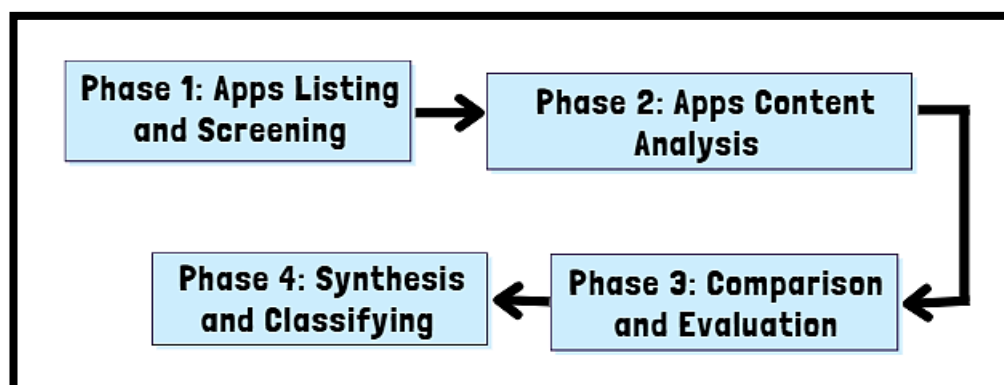


Figure 1: Methodology

Results And Discussions

According to Figure 2 and Table 1, the classification of educational tools presented offers important insights into how these platforms cater to various teaching and learning requirements. Tools such as Quizizz, Kahoot!, and Nearpod can be categorized like user friendly, competitive and vibrant and versatile indicating their adaptability and widespread appeal. Most of the educational tools can be assemble such as quizzes, games, collaborative tasks and tracking student progress. Likewise, tools like Padlet, Mentimeter and Canva are prominent in notes and vibrant creating creative environments for brainstorming, note-taking and developing visual content that boosts classroom involvement. This implies that integrating features such as interactivity, creativity, and gamification enhances student engagement and enriches the overall learning experience.

Even with the extensive variety available, the overlapping purposes of many tools can create confusion or lead to tool fatigue for educators and students. While specific tools emphasise quizzes and assessments, others combine classroom management, content creation, or even ambient support (such as Noisli for concentration). Without clear direction or integration, teachers might find it challenging to select the most effective mix of tools or could end up using multiple platforms redundantly. This underscores the necessity of not only assessing tools based on their features but also considering their ability to work together and how they integrate into the broader educational environment. Greater focus should be given to how these tools can seamlessly cooperate to enhance teaching objectives without overwhelming their users.

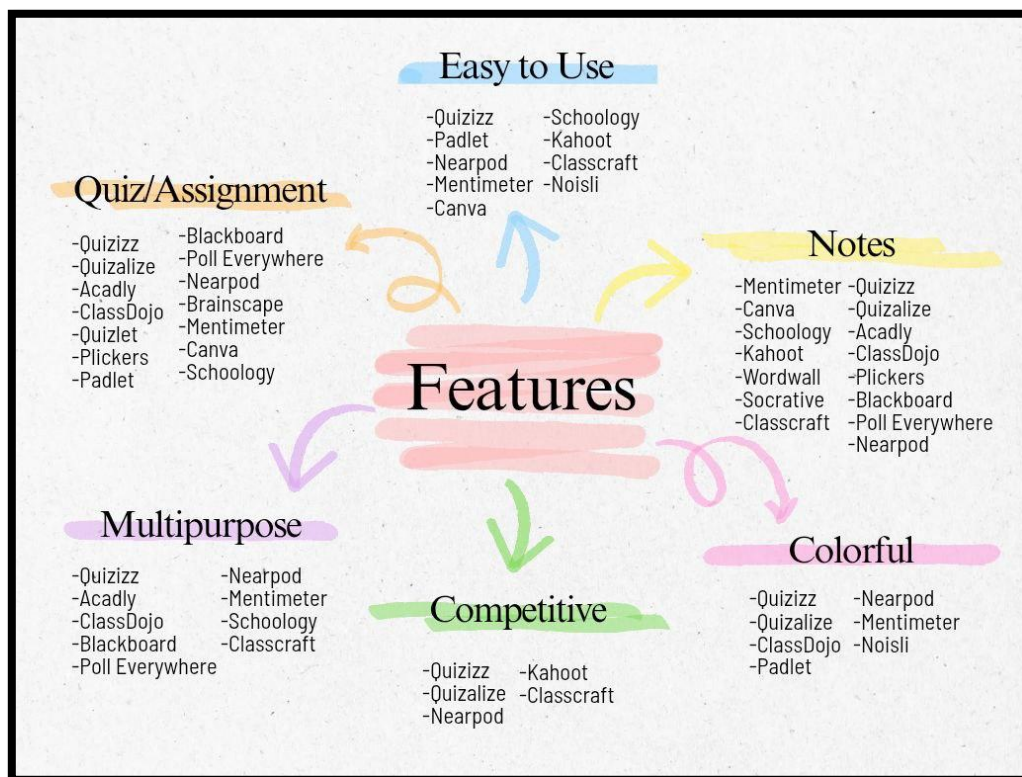



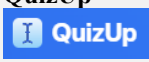






















Figure 2: Educational Tools Categorized by Features

Table 1: Summary of Educational Apps

NO	APPS	DESCRIPTION
1.	Kahoot! 	<ul style="list-style-type: none"> • Fun • Quiz-based learning platform • Can play live or self-paced games • Can create your own quizzes • Can study with flashcards or challenges. • Perfect for classrooms, virtual learning, family fun, and workplace training.
2.	Quizizz 	<ul style="list-style-type: none"> • Can solo or in groups • With millions of free quizzes across subjects
3.	Wordwall  Wordwall	<ul style="list-style-type: none"> • Can create your own teaching resources. • Make custom activities for your classroom like Quizzes, match ups, word games, and much more.
4.	Blooket 	<ul style="list-style-type: none"> • Fun • Game-based learning platform • Can create question sets and select a game mode. • Earn rewards • Stay motivated • Learning exciting and effective.
5.	99math 	<ul style="list-style-type: none"> • Math fun • Effective with fast-paced games for class or home. • Detailed reports help track progress and support personalized learning.
6.	Baamboozle 	<ul style="list-style-type: none"> • Fun. • Easy way to run whole-class games from a single screen. • No student devices needed. • Minimal prep and maximum fun.
7.	Factile 	<ul style="list-style-type: none"> • Ultimate online Jeopardy-style game. • Fun. • Engaging classroom reviews. • With features like Buzzer Mode, Multiple Choice, Flashcards, AutoGen AI question creator, and detailed analytics.
8.	Quizalize 	<ul style="list-style-type: none"> • Can now use without the need for electronic devices for every student. • Instantly scans your students' bubble sheet responses and syncs them to Quizalize.com, where you can track their performance and mastery.
9.	Flippity 	<ul style="list-style-type: none"> • Flashcards, quizzes, games, and more. • Create everything from trivia shows, timelines, word puzzles, and random name pickers to virtual breakouts, board games, and certificates.
10.	ClassTools.net 	<ul style="list-style-type: none"> • Create free games, quizzes, activities and diagrams in seconds.
11.	Slidemia 	<ul style="list-style-type: none"> • Free creative PowerPoint templates and Google Slides themes. Much more than just presentations.
12.	Acadly 	<ul style="list-style-type: none"> • Versatile classroom tool that helps instructors automate attendance and engage students in in-person, online, or hybrid. • With features like one-tap attendance, polls, quizzes, discussions, and word clouds. • Available on all devices. • Offers lecture playback, chat archives, and LMS integration.
13.	Socrative 	<ul style="list-style-type: none"> • Quizzes. • Polls. • Exit tickets. • The fun "Space Race" game.

		<ul style="list-style-type: none"> It supports multiple question types, instant reports, and works on any device or browser.
14.	Quizlet 	<ul style="list-style-type: none"> Flashcards. Expert solutions. Fun modes like Match and Write. Offers pronunciation in 18 languages and optional premium features for advanced study tools.
15.	ClassDojo 	<ul style="list-style-type: none"> Communication and classroom culture app. Teachers can reward behavior, share updates, and send photos or messages. Students can build digital portfolios, and parents get a real-time view of classroom life. Free and used globally, it works on any device.
16.	QuizUp 	<ul style="list-style-type: none"> Easy-to-use online quiz builder that automates grading and turns assessments. Create dynamic quizzes with text, code, and markdown. Students get immediate feedback, and teachers get real-time results—no manual grading needed.
17.	Classcraft 	<ul style="list-style-type: none"> Gamified classroom management platform that transforms learning into a collaborative adventure. Teachers can track behavior, run activities, and message families, while students level up characters and earn rewards. Parents can follow their child's progress and support good behavior. Compatible with Google Classroom, Classcraft promotes engagement, SEL, and positive classroom culture.
18.	Plickers 	<ul style="list-style-type: none"> Poll class for free, without the need for student devices. Just give each student a card (a "paper clicker") and use your Android smartphone or tablet to scan them to do instant checks-for-understanding, exit tickets, and impromptu polls.
19.	Padlet 	<ul style="list-style-type: none"> Flexible collaboration tool. Note-taking. Creative writing. Project planning. Simply drag and drop text, images, videos, or links onto a shared page and watch it update in real time. Padlet works on any device and supports nearly every file type.
20.	Noisli 	<ul style="list-style-type: none"> Background sound app that boosts focus, relaxation, and productivity. Mix ambient sounds like rain, forest, or white noise to create your ideal environment.
21.	Blackboard 	<ul style="list-style-type: none"> Helps students stay updated with courses, assignments, and grades. It enables access to content, quizzes, and tests, and works in sync with your institution's Blackboard server.
22.	Poll Everywhere 	<ul style="list-style-type: none"> Allows students and audiences to respond to live polls, quizzes, and presentations via app or web. It supports attendance tracking, graded questions, and response history, making it a go-to tool for engaging classes and events.
23.	Nearpod 	<ul style="list-style-type: none"> Interactive lessons with features like VR, 3D objects, polls, and simulations. Students can join teacher-led sessions or learn at their own pace while engaging through assessments, media, and collaborative tools.
24.	Brainscape 	<ul style="list-style-type: none"> Uses spaced repetition and active recall to speed up learning with flashcards. Can create, organize, and share decks, or study from expert-verified content.
25.	Mentimeter 	<ul style="list-style-type: none"> Turns any presentation into a fun, interactive experience using word clouds, live polls, quizzes, and Q&A. With no login required, audiences can participate anonymously, making it perfect for classrooms, workshops, and meetings.

26.	AhaSlides 	<ul style="list-style-type: none"> Presentation tool that adds live polls, quizzes, brainstorming, and Q&A to slides. Boosts engagement in both online and in-person meetings, and is great for teaching, team collaboration, and interactive events.
27.	Seismic Learning (Lessonly) 	<ul style="list-style-type: none"> Advanced sales training and coaching platform. Interactive training. Real-life simulations. Data-driven coaching.
28.	Canva 	<ul style="list-style-type: none"> Free Creating professional graphics, videos, and documents. Offers thousands of templates, powerful photo/video editing tools, and real-time collaboration.
29.	Schoology 	<ul style="list-style-type: none"> Learning management system that enables students and teachers to create, manage, and participate in academic activities on the go. Users can submit assignments, join discussions, take assessments, and collaborate with peers anytime, anywhere.
30.	TalentLMS 	<ul style="list-style-type: none"> High-quality training Combining AI-driven course creation and a user-friendly interface for both trainers and learners. Supports onboarding, employee, sales, and customer training, and comes with ready-made courses in essential soft skills. Fast setup and responsive design make it ideal for modern learning needs across teams.
31.	MindTickels 	<ul style="list-style-type: none"> Customizable all-in-one revenue enablement platform that combines training, content hubs, digital sales rooms, and AI-driven. It engages teams through contests and content modules, benchmarks performance, and tailors learning paths based on behavior insights.
32.	Classtime 	<ul style="list-style-type: none"> Real time assessments. Collaborative digital activities. Vast library of curriculum-aligned questions for K–12. Offers instant analytics, beautiful math notation, and multimedia integration to make lessons engaging and time-efficient for teachers and students alike.
33.	Quizshow.io 	<ul style="list-style-type: none"> Build interactive game. With 12 question types and full customization. No downloads needed—just fun, fast, and dynamic quizzes for any audience.
34.	Beekast 	<ul style="list-style-type: none"> Collaborative online meeting Transforms meetings, workshops, and training sessions into interactive, engaging experiences. Includes features like quizzes, whiteboards, word clouds, and real-time feedback. Hybrid teams and agile communication.
35.	Hypersay 	<ul style="list-style-type: none"> All-in-one platform that transforms in-person, hybrid, and virtual events. Hypersay Events supports multi-day, multi-language events with features like AI live subtitles. Hypersay Studio allows browser-based livestreaming with features like speaker green rooms. Hypersay Language provides live captioning, subtitle translation, interpreter audio, and sign language overlays. Hypersay Slides enhances presentations with live polls, quizzes, and feedback, turning slides into two-way conversations.
36.	Acadly 	<ul style="list-style-type: none"> Class management by automating attendance for in-person and online classes Integrating with Zoom, and offering interactive features like polls, quizzes, word clouds, and lecture replays. Supports backchannel discussions, works across all devices, and integrates with LMS platforms for enterprise use.

37.	Gimkit 	<ul style="list-style-type: none"> • Student-friendly quiz game that combines learning and fun through colorful, interactive multiple-choice questions. • Supports live and self-paced games, works on all devices, and features a reward system to boost engagement.
38.	Classpoint 	<ul style="list-style-type: none"> • Go-to classroom companion. • Integrated in PowerPoint, introduce improved presentation delivery, audience engagement, and gamified student learning.
39.	SlideLizard 	<ul style="list-style-type: none"> • Leading software for efficient Creation, interactive Execution and detailed Analysis of your presentations.
40.	myquiz.org 	<ul style="list-style-type: none"> • Web-based quiz platform ideal for live and hybrid events. • Offering an intuitive quiz builder with support for images, GIFs, and videos, no app installation required.
41.	QuizWhizzer 	<ul style="list-style-type: none"> • Gameboard element to quizzes where students race across custom-designed paths by answering questions correctly. • Making assessments fun and competitive.
42.	Classkick 	<ul style="list-style-type: none"> • Feedback-focused classroom platform where teachers can assign content-rich activities. • See real-time student progress, and offer personalized feedback • Students collaborate and engage via drawings, audio, and more. • All in one digital canvas.
43.	Kumospace 	<ul style="list-style-type: none"> • Offers a dynamic space for remote teams to collaborate in real-time using spatial audio. • multiple screen sharing, and team chat. • Reduces the need for constant scheduling and supports smooth • Productive communication with features like hand raising, recording, and instant messaging across individuals or entire teams.
44.	Genially 	<ul style="list-style-type: none"> • Interactive presentations. • Reports. • Proposals using thousands of customizable, animated templates.

Conclusions

In conclusion, the various educational application tools available today offer assistance to teachers and learners in enhancing their motivation and learning, depending on the subject. However, each tool has strengths and weaknesses that do not fully meet the user's needs. For future work, it is recommended to extend the research on creating a very useful application tool that focuses on all the necessary elements for educators and learners to ensure engagement during class.

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