



The Future of Education: How Mobile Learning, Microlearning, and Gamification are Revolutionizing Architecture Learning

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ABSTRACT

Human education has undergone various cycles of reform, yet many current education systems still rely on rigid models that do not meet the individual needs of students. Along with the advancement of technology and the digital revolution, there is a need for significant changes in the way education is delivered, especially in architectural education. This research aims to explore how mobile learning, microlearning, and gamification can revolutionize architecture education by meeting the increasingly diverse needs of students. This research uses a descriptive methodology that combines case studies and literature reviews to analyze current phenomena in architecture education. Findings show that the implementation of gamification, micro-learning, and mobile learning increases engagement, customization, and flexibility in architecture learning. Students now seek learning experiences that are interactive and customizable to their personal needs. By utilizing AI-based tools and more dynamic learning methods, educators can create learning environments that are more productive and responsive to the demands of the digital age. Architecture education in Indonesia, in particular, needs to adapt to international standards and modern challenges such as environmental sustainability. This research underscores the importance of integrating new technologies in architectural education to create more relevant and effective learning experiences. By adopting a more flexible and technology-driven approach, architecture education can better prepare students to face challenges in the world of work.

Keywords: Artificial Intelligence; Education System; Mobile Learning; Microlearning; Gamification

INTRODUCTION

Numerous reform cycles have reshaped the field of human education, influenced by changes in global structures, technological advancements, and societal demands (Shen et al., 2016). Our understanding of the most effective ways to pass on knowledge across generations has changed over time, starting with the earliest learning models in ancient civilizations and continuing with the contemporary educational systems in use today (Sahlberg, 2016). Nonetheless, the current educational system, which consists of preschool, kindergarten, primary, secondary, high school, and university courses, has largely not changed in a long time (Li et al., 2016; Tan, 2017). Although society may have benefited from this system

in the past, the advent of the internet and the ensuing digital revolution have put humanity on a new course. To keep up with this change, learning must undergo a significant reform.

Due to this mismatch between the demands of the contemporary workforce and traditional education, a large number of graduates are leaving school without the abilities and knowledge that businesses are looking for. The modern workplace requires problem-solving abilities, technical literacy, and adaptability—skills that aren't always prioritized in conventional educational settings. Because of this, an increasing number of graduates discover that they are unprepared for the demands of the contemporary job market (Angraini, et.al. 2024).

An Historical View: The Development of Education

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An Historical View: The Development of Education

Taking a step back and looking at how education has changed over time is crucial to comprehending the need for educational reform in the digital age (Collins & Halverson, 2018; Tyner, 2014). Early educational systems were usually reserved for the powerful and affluent. For instance, only boys from noble families could attend formal education in ancient Greece; other boys were either taught trades or went uninformed. Comparably, in medieval Europe, only the clergy and the upper class had access to education, which was primarily governed by religious organizations. Because of this, education was considered a privilege rather than a right, and access to it was frequently hampered by factors like geography, social class, and religion.

The 18th and 19th centuries saw tremendous changes brought about by the Industrial Revolution in both the economy and education. Governments started creating more widely accessible public education systems as factories demanded a better educated labor force. It was during this time that the primary, secondary, and tertiary education systems that we know today came into being. But this system was designed primarily to meet the demands of an industrial economy, emphasizing rote learning, discipline, and training people for jobs in factories or as secretaries (Alimi et al., 2021).

The Traditional Education System's Drawbacks

In addition to having a curriculum that is out of date, the current educational system is based on a one-size-fits-all approach that ignores the unique needs of each student. Teachers are frequently overworked and unable to give each student the individualized attention they require to succeed in the classroom. Furthermore, memorizing facts and performing well on standardized tests are rewarded in the system, not critical thinking, creativity, or problem-solving skills. This model might have been effective in the past when employment was more routine and needed specialized skill sets, but it is becoming less and less relevant in the quickly evolving world of today.

The Digital Age: A Novel Approach to Education

But as the world entered the era of the internet, it became evident that the conventional educational system, which had long been useful to industrial societies, was progressively becoming out of date. Virtually every industry has been affected by the digital revolution, and education is no different. Knowledge that was previously contained in textbooks or only accessible within specific institutions became instantly accessible with the introduction of the internet. This change started to erode the distinctions between formal education and self-directed learning while also democratizing access to information (Ajijola et al., 2021).

Transforming Education

Prior generations faced barriers to education related to social class, geography, nation, religion, and language. A student who was born into poverty might never set foot in a university lecture hall; a student who attends school in a rural location might have less opportunities than a student in an urban one. But as the world grows more digitally connected, many of these obstacles are falling apart.

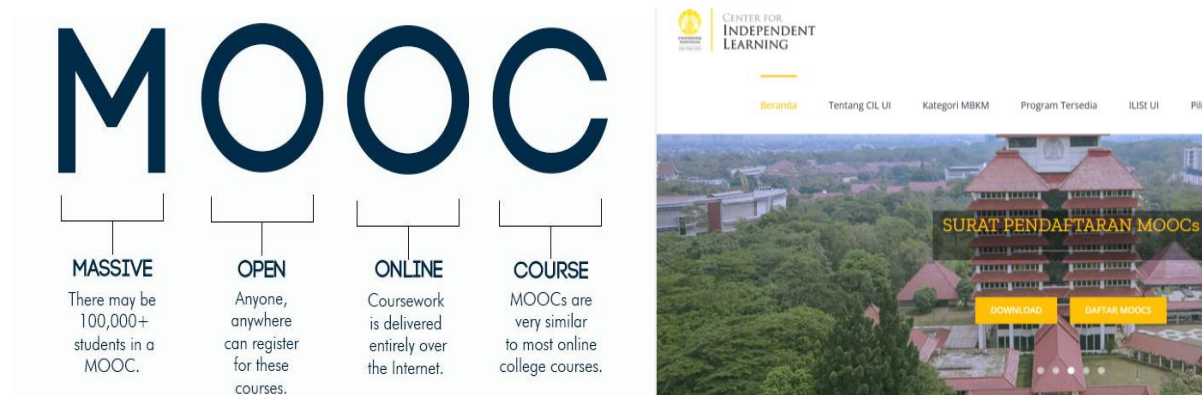


Figure 1. the use of MOOCs
Source: Teras Academy, 2024

Regardless of their native tongue, individuals can learn from institutions abroad thanks to online learning environments and universal translators. The way people learn has changed dramatically thanks to Massive Open Online Courses (MOOCs), online degrees, and an abundance of free educational resources.

RESEARCH METHODS

The advent of the internet and the ensuing digital revolution have put humanity on a new course. Architecture students no longer have to depend entirely on a human teacher to mentor them through their education thanks to AI-powered tools. This study describes current phenomena using a descriptive methodology that blends case studies and literature reviews. The emergence of gamification, microlearning, and mobile learning is changing the way that architecture education is provided and received. The changing tastes of today's architecture learners, who seek engagement, customization, and flexibility, are reflected in these trends.

RESULTS AND DISCUSSION

National Policy and Architectural Education

There are changes occurring in Indonesian architecture education that call for a more multidisciplinary, dynamic learning model and a greater emphasis on graduating students who can meet national and international standards of competence. Additionally, in order to compete with foreign architects, the graduates are expected to address modern issues like environmental sustainability, sociocultural diversity, and community development.

2007 saw the signing of the ASEAN Mutual Recognition Agreement (MRA) for architectural services by the Indonesian government. The UIA requests that architecture graduates complete a minimum of five years of architectural education in order to fulfill the requirements for ASEAN architects. The ASEAN Free Trade Year 2015 also highlights the difficulty of architecture education and practice at the regional level. The free trade agreement permits architects to practice in any of the ASEAN member countries and to follow the applicable standards of practice.

Actually, Indonesian architectural education at the undergraduate level is structured over four years, with a one-year break for the UIA requirement. A Professional Architecture Education Program (PPAR) was established in 2009 as an official step toward professional architecture education in Indonesia by the Indonesian Institute of Architects (IAI) and the Association of Architectural Higher Education in Indonesia (APTARI). The PPAR is a one-year continuation program or a portion of a two-year Master's degree program.

Just 14 of Indonesia's 159 architecture departments are listed as PPAR organizers, and only one of those, the University of Indonesia, is listed with the Ministry of Higher Education. This may present difficulties for Indonesian architectural education. Furthermore, in order to conduct architectural education in Indonesia, the general competence must be developed and used as a reference for curriculum standards.

In light of these opportunities and challenges, Indonesian architectural education programs need to be revitalized in order to address the dynamic changes and obstacles facing the profession at the international, regional, and local levels. To raise the standard of higher architectural education in Indonesia, IAI (Ikatan Arsitek Indonesia) and APTARI (Asosiasi Perguruan Tinggi Arsitektur Indonesia) launched the architectural education revitalization program in 2015. The curriculum, professional architecture education standard, and program learning outcome are all formulated with this revitalization program in mind.

Gen AI's Place in Education

Furthermore, learning is now even more customized and individualized thanks to generative AI, or GenAI. GenAI can offer individualized learning paths based on each student's strengths, weaknesses, and preferred method of learning, in contrast to the traditional classroom setting where a single teacher

must attend to the needs of numerous students simultaneously. AI is capable of teaching any subject and provides a plethora of knowledge to learners, enabling more self-directed and expedited learning for those with a strong desire to succeed.

The development of education has advanced significantly with the advent of generative AI. While earlier technological developments, such as the printing press, computers, and the internet, increased accessibility to education, artificial intelligence (AI) has the power to completely alter the way we approach learning. Students no longer have to depend entirely on a human teacher to mentor them through their education thanks to AI-powered tools. Alternatively, AI can serve as a constant tutor, ready around-the-clock to explain concepts, respond to inquiries, and even grade homework.

GenAI has the potential to change the game for those who know how to use it. It can deliver information in real-time, adjust content to fit a student's current comprehension level, and suggest resources to hasten their learning process. This stands in stark contrast to the traditional model, where instructors might not be knowledgeable about the most recent advancements in their fields. How can we expect teachers or lecturers to teach subjects they might not even be familiar with in a world where knowledge is expanding at a rapid pace? The swift advancements in fields such as biotechnology, robotics, and artificial intelligence pose a challenge for conventional educational establishments to stay up to date (Fortepiani, 2023).

A Hybrid Approach for the Future of Architecture Education

It's critical to understand that while GenAI and other digital tools present exciting opportunities for the future of education, they are not a cure-all. When it comes to encouraging creativity, critical thinking, and emotional intelligence, skills that AI is not able to easily mimic, human teachers continue to play a critical role. The best aspects of traditional education will probably be combined with the customization and flexibility provided by artificial intelligence in a hybrid model that will shape education in the future.

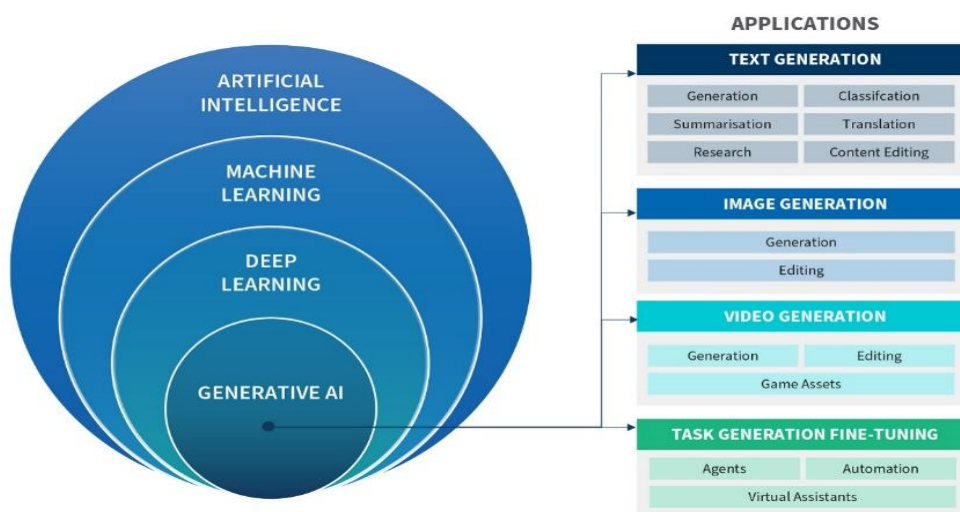


Figure 2. the example working tasks of Generative AI

Source : FTI Consulting, 2024

Education in the future will be a continuous process that is tailored to the needs of each individual student as well as the demands of a world that is changing quickly, rather than being restricted to classrooms and strict curricula. In order to create personalized, real-time learning experiences, artificial intelligence (AI) and other technological advancements like GenAI must be combined with human-led instruction that encourages creativity, emotional intelligence, and critical thinking (Nykonenko, 2023).

Education establishments need to adopt reforms that prioritize flexibility, integrating technology, and fostering critical thinking and problem-solving abilities in order to get ready for this future. To meet the diverse learning needs of their citizens, governments and educators must invest in new curricula, teacher training, and AI-driven tools. Furthermore, since technological advancements are rendering some knowledge and skills outdated faster than others, there is a need for a cultural shift towards appreciating continuous education and lifelong learning.

The Development of Mobile Architecture Learning via Smartphones, Tablets, and Microlearning

Mobile technology has become ingrained in almost every aspect of our daily lives in the modern era. We have entered an era where information is not only easily accessible but also delivered in more convenient and engaging ways than ever before thanks to the introduction of smartphones and tablets. The move toward microlearning and modular learning systems, which meet the needs of the modern learner, is one of the biggest changes brought about by mobile devices. Through increased accessibility, adaptability, and personalization of learning, this shift is radically changing the nature of education and training.

Microlearning: Getting Used to Less Attention

Traditional teaching and learning strategies, which frequently entail drawn-out lectures or lengthy reading sessions, are showing to be less successful as society grows faster. Research has indicated that students' attention spans have been getting shorter, especially for younger learners. This is where the idea of microlearning—which imparts knowledge in brief, easily assimilated bursts—becomes more and more beneficial. Modern learners prefer shorter, more concentrated learning sessions, which is something that microlearning capitalizes on. This method breaks up the content into manageable chunks that students can finish in a few minutes rather than providing them with lengthy readings (Adeoye, 2023).



Figure 3. the advantages of mobile learning

Source : Keenethics, 2024

Microlearning is a trend in learning design that involves dissecting an idea or concept into its most basic components within a program, course, or module. These educational opportunities are typically highly targeted, consisting of numerous brief lessons that typically last between two and eight minutes and produce very particular learning objectives.

Two common modes of online learning are synchronous and asynchronous learning

In the field of education, instructional design plays a crucial role in creating effective learning experiences for students. With the advancement of technology, online learning has become increasingly popular, offering flexibility and accessibility to learners. Two common modes of online learning are synchronous and asynchronous learning. Synchronous learning refers to real-time interaction between instructors and learners, while asynchronous learning allows learners to access course materials and participate in discussions at their own pace and time. This article aims to explore the characteristics of synchronous and asynchronous learning, highlighting their benefits and challenges, and providing insights into instructional design strategies for each mode.



Figure 4. Learning Setting : Synchronous and Asynchronous learning

Source : freepik.com, 2024

Characteristics of Synchronous Learning

Synchronous learning involves live interaction between instructors and learners, typically through video conferencing platforms or virtual classrooms. This mode of learning offers several distinct characteristics that contribute to its effectiveness. Firstly, synchronous learning promotes immediate feedback and clarification. Instructors can provide instant responses to learners' questions and concerns, fostering a sense of engagement and active participation (Mansour, 2024; Tawalbeh & Al-Husban, 2023). This real-time feedback allows learners to address their doubts promptly, enhancing their understanding of the subject matter. Secondly, synchronous learning facilitates social presence and collaboration. Through live discussions and group activities, learners can interact with their peers, share ideas, and engage in collaborative learning (Marshall & Kostka, 2020; Wang et al., 2016). This social interaction promotes a sense of community and can enhance the learning experience by providing diverse perspectives and fostering critical thinking skills. Furthermore, synchronous learning offers structure and accountability. Learners are required to attend scheduled sessions, which helps them establish a routine and maintain discipline in their studies. The fixed schedule also allows instructors to monitor learners' progress and provide timely support and guidance.



Figure 5. the example of Open Online Courses, SPADA INDONESIA

Source : spada indonesia, 2024

However, synchronous learning also presents challenges. One of the main challenges is scheduling conflicts, especially for learners in different time zones or with busy schedules (Hollister et al., 2022). Additionally, technical issues such as poor internet connectivity or audio/video problems can disrupt the learning experience (Johnson, 2017). To mitigate these challenges, instructors should provide alternative means of accessing course materials and recordings of synchronous sessions to accommodate learners' diverse needs.

Characteristics of Asynchronous Learning

Asynchronous learning, on the other hand, offers flexibility and self-paced learning opportunities. Learners can access course materials, lectures, and assignments at their convenience, allowing them to manage their time effectively and accommodate other commitments.

One of the key characteristics of asynchronous learning is its flexibility. Learners have the freedom to choose when and where they engage with the course content, enabling them to personalize their learning experience (Pratiwi & Priyana, 2022). This flexibility is particularly beneficial for learners with busy schedules or those who prefer to learn at their own pace.

Another characteristic of asynchronous learning is the opportunity for reflection and deep learning. Learners can review course materials, engage in critical thinking, and take the time to formulate thoughtful responses in discussions (Buelow et al., 2019). This mode of learning encourages independent thinking and self-directed learning, which are essential skills for lifelong learning.

Furthermore, asynchronous learning promotes accessibility and inclusivity. Learners with different learning styles, abilities, or time constraints can engage with the course content at their own pace, ensuring equal opportunities for all (Leka & Roseni, 2022). This mode of learning also allows learners to revisit course materials and review concepts as needed, enhancing their understanding and retention of the content.

However, asynchronous learning also presents challenges. One of the main challenges is the potential for reduced engagement and motivation. Without real-time interaction and immediate feedback, learners may feel isolated or lack accountability (Pratiwi & Priyana, 2022). To address this challenge, instructors should design interactive and engaging activities, provide clear expectations and deadlines, and foster a sense of community through online discussions and collaborative projects.

Instructional Design Strategies for Synchronous Learning

Instructional development provides various strategies to maximize the benefits of synchronous learning. Firstly, they should create interactive and engaging activities that encourage active participation and collaboration.(Arghode et al., 2018). It includes forum discussions, case studies, simulations, or live problem-solving exercises. These activities encourage learners to apply their knowledge, critical thinking, and peer evaluation.

Secondly, instructional designers should ensure clear communication and provide opportunities for immediate feedback (Lozano et al., 2019). This can be achieved through chat features, votes, or breakout rooms in video conferencing platforms. Instructors should actively monitor the chat and address learners' questions and concerns live, creating a supportive and responsive learning environment.

Nonetheless, instructional designers should consider multimedia and visual aids to enhance the learning experience (Revyakina & Sakharova, 2021). It includes videos, interactive presentations, and virtual demonstrations that help to explain complex concepts while capturing learners' attention visually.

Instructional Design Strategies for Asynchronous Learning

To promote effective asynchronous learning experiences, instructional designers should employ a variety of targeted strategies. Foremost among these is the need to develop course materials that are thoughtfully structured and organized (Picciano, 2019). Utilizing features like intuitive navigation, clear instructions, and a logical content arrangement enhances usability for learners, allowing them to efficiently locate the information they require.

In addition, incorporating interactive elements and opportunities for self-assessment is crucial for enhancing student engagement and encouraging self-reflection (Karthik et al., 2019). Activities may include quizzes, discussion forums, and reflective journals. These tasks encourage learners to engage actively with the material, apply their understanding, and critically reflect on their learning journey.

Moreover, instructional designers should establish clear guidelines and expectations for asynchronous discussions (Abou-Khalil et al., 2021). This entails providing specific prompts, outlining participation requirements, and defining assessment criteria. When explicit expectations are communicated, learners are more likely to engage actively in discussions and contribute meaningfully to the learning community.

Table 1. Summary Table characteristics of synchronous and asynchronous learning

Characteristic	Synchronous Learning	Asynchronous Learning
Interaction Models	Live, real-time interaction between instructors and learners	Learners access content and activities on their own schedule, without time constraints
Feedback Mechanism	Immediate responses and clarifications possible	Feedback durations; learners might need to wait for responses from instructors or peers
Engagement & Participation	Promotes active involvement through live discussions and activities	Learners engage at their own pace, requiring greater intrinsic motivation
Social Presence	Strong sense of community through live interaction	Can be built via forums and group assignments, but lacks immediacy
Schedule Flexibility	Fixed schedule where learners must be present at specific times	Flexible; learners decide when to access materials and participate
Accountability & Structure	Scheduled sessions enforce routine and discipline	Relies on self-discipline; learners manage their own progress

Technical Challenges	Poor internet connection or technical issue can disrupt the live sessions.	Requires reliable access to platforms, but less dependent on real-time stability
Impact of Time Zones	Create difficulties in participants's schedule with different time zones	Accommodates global participants with different time zone
Opportunity for Reflection	Limited Live session	Enhanced; learners can revisit materials and reflect at their own pace
Accessibility and Inclusivity	Less suit for public / general due to fixed schedules	Suitable for diverse learning styles, schedules, and pacing requirements
Learning Depth	Focuses on collaboration and fast engagement	Encourages deep, self-paced learning, critical thinking, and exploration
Collaborative Activities	Real-time group discussions, case studies, or simulations	Allows for longer-term, flexible collaborative projects
Content Access	Limited to live course duration; but recordings may be provided	Unlimited access to materials for revisiting and deeper knowledge
Challenges	Scheduling conflicts, technical issues, and limited time for reflection	Risk of isolation, need for self-motivation, and delayed feedback
Instructional Design	Interactive elements, clear communication, and multimedia usage	Requires structured content, self-assessments, and clear guidelines for discussions

Source : author research, 2024

Modular learning divides content into discrete, stand-alone blocks or modules, expanding upon the ideas of microlearning. Because of the interchangeable and adaptable nature of these modules, students can tailor their education to suit their unique interests and needs. Modern learners, who want educational experiences that are immediately applicable to their lives or careers, find this level of customization particularly appealing. Students using traditional learning methods are frequently required to follow a strict curriculum that may not always be in line with their interests or personal goals. Instead, learners can customize their learning experience by selecting the modules that are most pertinent to them through modular learning.

Gamification: Increasing Involvement with Interactive Education

The concept of gamification may be familiar to many, yet misunderstandings surrounding it remain prevalent. This approach involves incorporating game elements into the design of learning plans or training programs. However, it is important to note that simply adding games to a learning framework does not constitute gamification.

True gamification transcends the mere addition of games; it integrates these elements into a deeper educational context, such as a classroom setting. While gamification is often closely associated with education, the following information will provide a broader perspective on its potential to enhance the quality of learning..

1. Research indicates that challenge-based gamified learning methodologies have resulted in an impressive enhancement of student performance, with an increase of 89.45%.
2. A substantial 67% of learners express that gamification within the educational context is perceived as significantly more stimulating and engaging than traditional pedagogical approaches.
3. Approximately 75% of educators across the United States have adopted digital gaming as a strategic tool to facilitate and enrich the learning experience for their students.
4. A noteworthy 80% of learners contend that their academic outcomes would be significantly improved if the educational process integrated game-like elements and features.

5. Seventy percent of educators have observed a considerable enhancement in student engagement levels following the incorporation of educational video games into their instructional practices.

As an educator, if you plan to combine games and education, you must approach it methodically. And to do that, you must be thorough with what gamification means in learning and teaching. The process of adding game-like elements to educational experiences, or gamification, is another powerful trend that is reshaping education. The growing gaming industry is making it more and more clear that learning environments can be made more engaging and motivating by utilizing the mechanics of gaming, such as competition, challenges, and rewards.

Microlearning is a trend in learning design that involves dissecting an idea or concept into its most basic components within a program, course, or module. These educational opportunities are typically highly targeted, consisting of numerous brief lessons that typically last between two and eight minutes and produce very particular learning objectives.

As students finish assignments, receive badges, or advance through various levels of mastery, gamification plays on our innate desire for achievement and advancement. Students' engagement, which is frequently low in traditional learning environments, can be greatly increased by educators by transforming the learning process into a series of interactive challenges (Al Husaeni, et.al. 2024).

Gamification is used, for instance, by language learning applications such as SPADA INDONESIA, which award users with badges, points, and progress charts upon lesson completion. Students are motivated and excited when they are encouraged to set goals, monitor their progress, and compete with others. This approach is being used to teach a variety of subjects, including history and mathematics, and it can be modified to fit the needs of students of all ages. It is not just restricted to language learning (Al-Nuaimi, et.al 2021).

A competitive and cooperative spirit can be fostered by incorporating gaming mechanics into learning modules; these are two powerful motivators. Timed tests, leaderboards, and group projects can motivate students to push themselves to not just finish but also surpass assignments. This gives learners immediate feedback, which is essential for maintaining their interest, especially when combined with the ability to track progress.

Gamification of lessons aims to build interest and motivation and make learning engaging.

Looking back, it's clear that gamification has been around for quite some time. Educators have long utilized creative contests and group activities to engage and educate students in enjoyable ways. However, the term "gamification" gained popularity with the advent of technology and the digital revolution.

Today, 58% of Gen Z learners use their smartphones to engage in both online and offline games. Furthermore, more than two-thirds of Millennials in the U.S. enjoy playing video games. Reports indicate that 90% of video game players find that gaming brings them immediate joy, 79% feel inspired by the experience, and 87% report positive mental stimulation and stress relief. Given this, if we can create a gamified learning environment, it would not stand to reason that students would become quicker learners.

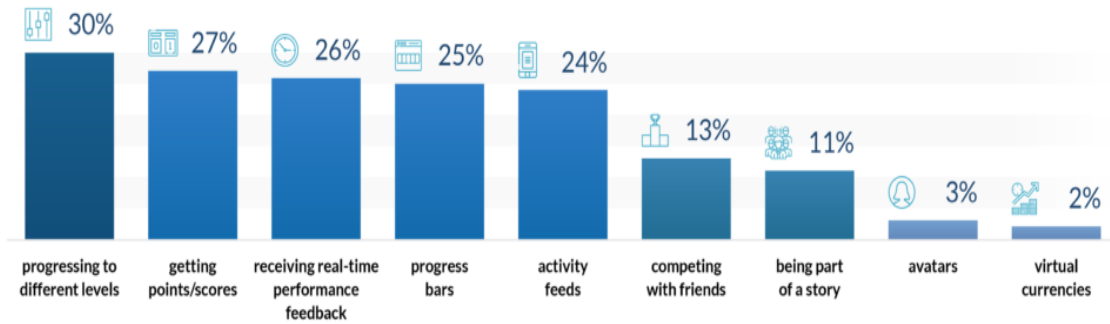


Figure 6. Preferred Gamification Strategies of Adult Learners

Source : author research, 2024

Additionally, gamification plays to the comfort level of contemporary learners with digital interfaces. Gamified learning is a perfect fit because younger generations, in particular, have grown up with social media, interactive apps, and video games. Gamified education's use of visuals, audio, and instant gratification contributes to a more immersive experience that keeps students motivated and interested for extended periods of time (Alam et al, 2023).

Two Approaches of Learning through Gamification

The theory of gamification focuses on the fundamental objective of aiding learners in developing essential skills through engaging and enjoyable experiences. Educators commonly implement this concept through two primary strategies:

1. The incorporation of games and activities specifically designed for entertainment that also yield educational advantages by aligning with defined learning objectives. The strategy is widely recognized as the "game-based learning approach."
2. The integration of elements, mechanics, and features characteristic of popular game designs into educational contexts, thereby transforming monotonous lessons into dynamic and interactive experiences. This methodology is primarily referred to as "gamification in education."

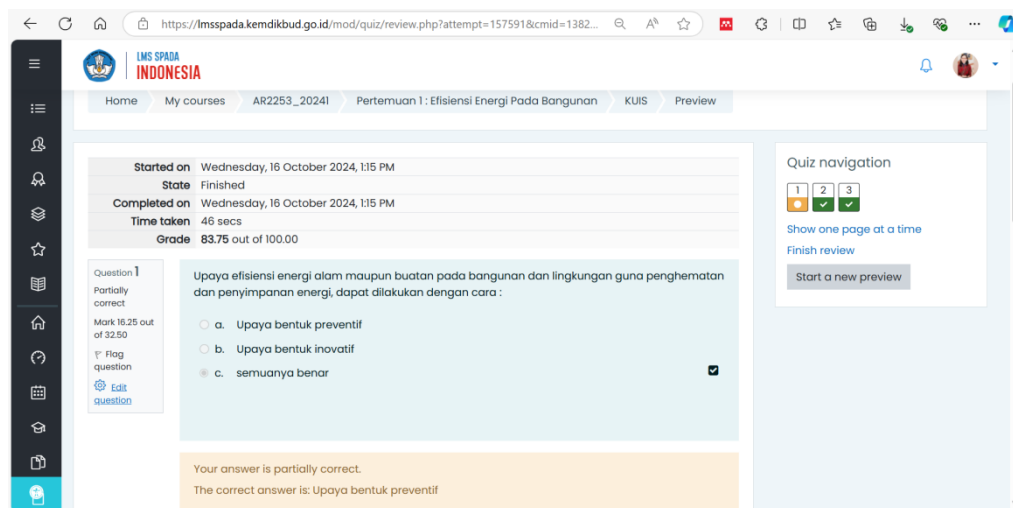


Figure 7. courses at SPADA INDONESIA account for architecture lecturers and student.

Source : spada indonesia, 2024

While educational institutions are more focused on the second approach, it is important to acknowledge that the first approach is designed to entertain learners with aligned learning objectives. Classrooms are indeed for learning and developing innate skills. However, think about the need to build perseverance, self-confidence, patience, critical thinking skills, a competitive mentality, and coping skills—virtues that every individual should master. Simple games such as speed races, puzzles, or word games can help learners absorb these values.

The second approach, on the other hand, is more acceptable because, in the context of online or digital learning, educators can implement it in various ways and add creative structures to their Learning Management System (LMS). When implemented correctly, both forms of gamification encourage students to learn new theories, formulas, and concepts on their own.

Best strategies of gamification in education



Figure 8. Best strategies of gamification in education

Source : pickcel.com, 2024

To effectively address these challenges, educators should offer diverse methods for accessing course materials and content. This approach ensures that all students have equitable opportunities to engage with the learning material, enhancing their educational experience.

1. Point Systems and Perks: Builds motivation, tracks progress, and increases engagement.
2. Leaderboards and Perks: Fosters teamwork and develops a competitive mindset.
3. Badges and Perks: Provides recognition for students, driving enthusiasm.
4. Challenges and Perks: Promotes critical thinking, builds persistence, and cultivates a go-getter attitude.
5. Surprises and Perks: Channels enthusiasm and reflects individual personalities.
6. Avatars or Role-Playing and Perks: Encourages creativity, enhances communication skills, and positively impacts overall personality.
7. Quests and Perks: Promotes collaboration, teaches information gathering and sharing, and develops patience and problem-solving skills.
8. Quizzes and Perks: Encourages brainstorming and builds confidence.

Digital signage-assisted learning with gamification.

Create game-oriented activities and microlearning modules on slides and present them using digital signage screens. The vibrant and appealing audio-visual elements enhance student engagement with their lessons, facilitating quicker learning. Animated explanations of concepts or mathematical equations, pictorial stories, image compositions, and video demonstrations of biological ideas can be displayed on digital screens. By utilizing applications like Web URL, YouTube Video, and others, educators can showcase any web-based material on the screens.

Instructors can also design quiz games and word puzzles for the digital reader boards. The incorporation of gamification enhances interactive teaching and learning experiences. Education is further enriched by interactive technology through gamification. Interactive digital signage can make the learning process more enjoyable. Educators can turn the classroom into an interactive knowledge hub with multi-touch displays. Students can directly access learning applications or websites on the interactive panels, leading to a dynamic educational experience. The split-screen capability allows teachers to maintain multiple learning modules and game-oriented activities open on the digital display-turned-interactive board. Visual learners, in particular, feel inspired to engage with study materials independently, enabling them to learn while enjoying the process.

Guarding Digital Transformation, The Directorate General of Higher Education, Research and Technology Launches Guidebook for Using GenAI

The Directorate General of Higher Education, Research and Technology (Ditjen Diktiristek), through the Directorate of Learning and Student Affairs (Belmawa), has officially introduced two publications concerning the transformation of AI usage in higher education, in Jakarta, on Friday 11 October 2024. The two books are entitled Guide to Using GenAI in Learning in Higher Education and Leading Change in the Transformation of Higher Education in Indonesia.

The development of GenAI technology has great potential and opens a window for digital capabilities, especially in the world of education. The guidebook for implementing GenAI reflects the dedication of the Directorate General of Education and Technology, specifically through the Belmawa Directorate, to enhance the quality of the educational process by fostering a more dynamic and interactive learning environment. Hoping that this book can provide benefits to the academic community in producing a generation that is ready to face current challenges and adapt to future developments. This book is an effort to prepare superior, competent human resources in order to welcome the golden generation in 2045. This book is here to respond to digital challenges ethically and with a sense of responsibility. If GenAI is used wisely, it will greatly influence the effectiveness and efficiency of our learning in the future, therefore this book is here to provide a clear and practical overview and guidance.



Figure 9. Guide book regarding the transformation of the use of AI in higher education 2024

Source : dikti.kemdikbud.go.id, 2024

The guidebook for using GenAI is aimed at lecturers and students to maximize the ethical use of GenAI in the learning process in higher education. This is motivated by the use of GenAI, whose existence cannot be limited in this era of globalization. Therefore, it is important to have guidelines to continue to accept the flow of GenAI technology but still prioritize ethics and responsibility. This book explains the GenAI tools for lecturers and students. The hope is that the use of GenAI can be maximized positively and reduce negative impacts. This can be realized by prioritizing the ethics of using GenAI responsibly. A complete explanation regarding the ethical use of GenAI by downloading the book at the link: s.id/PanduanGenAI.

The contents of this guidebook for using AI on Indonesian campuses include; use of generative AI by students and lecturers, opportunities for using AI, various applications of generative AI, ethics of its use, AI literacy, challenges and risks of generative AI, strategies for preventing generative AI risks, and considerations for selecting generative AI.

In the guidebook there are also recommendations for using AI for students, such as 1) Respect exam laws and regulations. It is important to always comply with applicable laws and regulations in academic and examination contexts. 2) Reflect on your learning goals. Always think back and set learning goals so that using ChatGPT can be more focused and useful. 3) Use ChatGPT as a writing partner. Take advantage of ChatGPT to help with the writing process, whether it's brainstorming ideas, drafting, or improving writing. 4) Use ChatGPT as a learning partner. Think of ChatGPT as a tool that can provide explanations, examples and practice questions to deepen your understanding of the material being studied. 5) Iterate and discuss with ChatGPT. Use ChatGPT to discuss and iterate on concepts that are difficult to understand. This helps in clarifying and strengthening understanding. 6) Summarize learning material with ChatGPT. ChatGPT can help summarize learning material, making it easier to remember and understand. 7) Improve coding skills with ChatGPT. Take advantage of ChatGPT to improve coding skills by requesting code examples, explanations, or debugging help. 8) Be aware of the risks when using ChatGPT. Recognize and understand the risks that may arise when using this technology, such as inaccurate information or bias that may exist in the data. 9) Read the checklist wrap-up on this section before using ChatGPT. Be sure to read and understand the checklist provided on this section to maximize the benefits and reduce the risks of using ChatGPT. Those are 9 recommendations for using AI for students based on the official GenAI guidebook from the Ministry of Education and Culture.

The Coming Together of Microlearning, Gamification, and Mobile Devices

Mobile devices, microlearning, and gamification come together to form a potent educational ecosystem that meets the needs of today's learners. The method is offered by microlearning, the platform is provided by mobile technology, and engagement is guaranteed by gamification. When taken as a whole, they signify a significant departure from conventional classroom-based education and the transition to a more adaptable, dynamic, and customized learning environment. Lastly, the way these trends are incorporated into formal education structures needs to be reconsidered by the larger education system. Universities and colleges should investigate how gamification and microlearning can enhance conventional curricula, giving students the best of both worlds: a solid academic foundation and the freedom to learn at their own pace.

CONCLUSION

In conclusion, synchronous and asynchronous learning possess unique characteristics and advantages for learners. Synchronous learning fosters immediate feedback, social presence, and a structured environment, whereas asynchronous learning provides flexibility, opportunities for reflection, and increased accessibility. Instructional designers are vital in optimizing the benefits of both methods

by implementing suitable strategies. For synchronous learning, it is essential to incorporate interactive activities, maintain clear communication, and utilize multimedia integration. In contrast, asynchronous learning thrives on well-organized course materials, engaging activities, and explicit discussion guidelines. By comprehending the distinct features of each mode and applying effective instructional design techniques, educators can create compelling and productive online learning experiences for their students. The emergence of gamification, microlearning, and mobile learning is changing the way that architecture education is provided and received. The changing tastes of today's architecture learners, who seek engagement, customization, and flexibility, are reflected in these trends. Teachers or lecturers, companies, and students can all work together to establish a more dynamic and productive learning environment that meets the demands of the digital age by embracing these trends. As time goes on, the capabilities of mobile technology, the flexibility of microlearning, and the inspiration provided by gamification will determine the direction of architecture education rather than the physical walls of a classroom.

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