Original Article

e-ISSN: 2775-5037
p-ISSN: 2614-3917

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The Learning Preferences of Generation Z in Active Learning and Its Implications for Improving Educational Quality: A Perspective of Educational Management

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Submited : 12 Januari 2026
Revised : 15 Januari 2026
Acceptance : 20 Januari 2026
Publish Online : 24 Januari 2026

Abstract:

The changing characteristics of 21st-century students, particularly Generation Z, drive the need for transformation in learning approaches. This generation demonstrates a strong preference for active learning models that require engagement, technology, and contextual learning experiences. This study aims to examine how Gen Z's preference for active learning can serve as a strategy for improving educational quality from the perspective of educational management. The method used is a literature review with a qualitative descriptive approach. The findings indicate that the systematic implementation of active learning, supported by adaptive educational management, can enhance learning outcomes, student satisfaction, and teaching effectiveness. Managerial implications include flexible curriculum planning, faculty training in active pedagogy, and a quality assurance system based on participatory learning.

Keywords: Generation Z, Active Learning, Educational Management, Educational Quality

Introduction

The changing profile of students in the digital age calls for innovation in learning approaches in higher education. Generation Z is known for being highly responsive to technology, preferring quick interactions, and learning through experience. Traditional learning models struggle to meet these needs, creating a demand for the adoption of more active and participatory approaches. Active learning has emerged as one of the most suitable learning models for this generation's characteristics. However, the adoption of this method cannot be limited to just technical aspects in the classroom; it needs to be supported by an educational management system that focuses on quality. Therefore, it is crucial to examine Generation Z's learning preferences for active learning and how this approach can be used as a strategy to enhance the quality of education(Wajdi et al. 2024).

The generational shift in higher education has significant implications for effective

learning approaches. Generation Z, born between 1997 and 2012, possesses unique characteristics: digital literacy, multitasking, a tendency to become quickly bored with passive methods, and a preference for visual and collaborative approaches (Merriman, 2020). In this context, traditional learning models such as one-way lectures have become less relevant in fostering engagement and deep understanding(Singjai 2024).

One approach that has proven effective for this generation is Active Learning, a teaching strategy that encourages students to engage actively through discussions, simulations, problem-solving, and project-based activities(Freeman 2025). Research shows that active learning not only significantly improves learning outcomes but also enhances information retention, critical thinking skills, and overall learning satisfaction(Jaleniauskiene and Kasperiuniene 2023).

From the perspective of educational management, the preference for active learning signals the need to adjust the learning system accordingly. This includes curriculum planning, faculty development, the provision of learning resources, and comprehensive quality assessment of the learning process (Biggs, Tang, and Kennedy 2022). Thus, understanding Generation Z's learning preferences is not only relevant in the pedagogical context but also an essential part of a systemic strategy to improve the quality of higher education.

Adopting active learning requires a strategic shift in both pedagogy and the supporting structures that facilitate its implementation. For instance, higher education institutions need to adopt flexible curriculum frameworks that can accommodate interactive learning activities, collaborative projects, and technology-enhanced learning tools. Faculty members, too, must be equipped with the necessary skills to facilitate active learning experiences. This involves training in modern pedagogical techniques and learning technologies to create an environment where students are encouraged to take ownership of their learning process(Düzenli 2021).

Moreover, the integration of technology into learning spaces has become a crucial factor in supporting active learning. Tools such as online collaborative platforms, simulation software, and digital content creation are essential in fostering an engaging and participatory learning environment. These tools not only align with the preferences of Generation Z but also provide students with opportunities to engage in real-world applications of knowledge, preparing them for the challenges of the 21st-century workforce(Cain et al. 2022).

The implementation of active learning also necessitates a shift in assessment practices. Traditional exams and quizzes that measure rote memorization are increasingly inadequate in evaluating the skills that are fostered through active learning. Instead, assessments should focus on evaluating critical thinking, problem-solving, collaboration, and the ability to apply knowledge in real-world contexts. This requires a comprehensive rethinking of how academic achievement is measured, ensuring that the assessments align with the active learning strategies employed in the classroom(Hernandez-de-Menendez, Escobar Díaz, and Morales-Menendez 2020).

From an educational management perspective, the successful implementation of active learning also requires continuous evaluation and feedback loops. Institutions must regularly assess the effectiveness of their teaching strategies, the quality of the learning experience, and the outcomes of their educational programs. This feedback can then inform improvements in teaching practices, curriculum design, and resource allocation, ensuring that the system remains adaptive to the evolving needs of Generation Z(Iftode 2019).

In conclusion, the learning preferences of Generation Z highlight a significant shift in how education should be approached in the digital age. Active learning offers a promising model to meet the needs of this generation, but its successful implementation requires comprehensive support from educational management systems. By adapting curriculum, faculty development, learning resources, and assessment practices, higher education institutions can create a learning environment that not only enhances student engagement and learning outcomes but also ensures continuous improvement in educational quality. Understanding and responding to the learning preferences of Generation Z is not just a pedagogical necessity; it is a strategic imperative for the future of higher education(WARDI et al. 2025).

Methods

This study uses a descriptive qualitative approach with a literature review (library research) method. Data was gathered from relevant national and international scholarly journals, educational policy documents, and theoretical sources from literature in educational management, pedagogy, and learning innovation. The steps involved in the study are as follows:

1. **Literature Search and Selection:**

   A comprehensive search was conducted to identify relevant literature related to Generation Z, active learning, and educational management. This included:
   - Peer-reviewed academic journals in the fields of pedagogy, educational management, and active learning.
   - Educational policy documents at both national and international levels, focusing on curriculum design, teaching strategies, and quality assurance in higher education.
   - Theoretical frameworks and models of active learning, including those supported by educational theorists such as (Biggs et al. 2022).
2. **Data Collection:**

   The data collected consisted of:
   - Empirical studies and theoretical works on active learning and its effectiveness, particularly in enhancing student engagement and academic performance.
   - Documents on educational management practices that align with active learning, particularly those focused on quality assurance and curriculum planning.
   - Reports on the educational characteristics and preferences of Generation Z, especially in terms of their learning styles and technological engagement(Azman et al. 2021).
3. **Data Analysis:**

   The collected data was analyzed using a thematic approach to identify patterns and trends. Key themes included:
   - The characteristics of Generation Z and how these traits affect their learning preferences.
   - The relationship between active learning strategies and improvements in student learning outcomes, critical thinking, and retention.
   - Managerial and organizational factors that influence the successful implementation of active learning in higher education institutions(Hendrastomo and Januarti 2023).
4. **Synthesis and Implications:**

   The findings were synthesized to form an understanding of how Generation Z's preferences for active learning can be incorporated into educational management strategies to improve overall educational quality. The implications for curriculum design, faculty development, and assessment practices were also discussed, emphasizing the need for an adaptive educational management system that supports active learning methodologies(Afshar et al. 2019).

   By adopting a literature review approach, this study aimed to provide a broad understanding of existing research and theoretical perspectives that highlight the impact of active learning on improving education, particularly in the context of Generation Z and educational management(Jurenka et al. 2018).

Results

Based on the findings from various literatures analyzed, it was found that the learning preferences of Generation Z strongly support the implementation of Active Learning in higher education. Generation Z, born in the digital era, shows a strong inclination towards interactive

and technology-based learning methods. They are more interested in approaches that integrate digital tools such as videos, simulations, and online platforms, as well as learning that is relevant to real-life contexts. They also tend to prefer project-based and collaborative learning, where they can interact with peers and engage directly in the learning process(Pierson 2022).

The implementation of Active Learning has proven to be effective in increasing student engagement and learning outcomes. Research by (Freeman 2025) shows that Active Learning enhances academic performance, particularly in STEM fields (Science, Technology, Engineering, and Mathematics), as well as improving critical thinking skills and problem-solving abilities. Additionally, this approach strengthens information retention because students are actively involved in the learning process rather than passively receiving information. (Deslauriers et al. 2019) found that active engagement in the classroom can enhance students' understanding of the subject matter and their overall satisfaction with the learning experience(Sumiya et al. 2025).

From the perspective of educational management, these findings indicate that the success of implementing Active Learning depends not only on technical aspects within the classroom but also on the support from an adaptive educational management system. Managerial factors influencing the successful implementation of Active Learning include flexible curriculum planning, faculty development in active pedagogy, and the provision of learning infrastructure that supports collaborative discussions and technology use. Furthermore, a comprehensive quality evaluation of the learning process, which focuses not only on academic outcomes but also on the quality of the active learning process, is essential in ensuring the sustainability and success of this method(Kanashiro et al. 2020).

The managerial implications drawn from these findings highlight the importance of curriculum planning that not only covers academic content but also allows room for interactive and project-based learning methods. Higher education institutions should also provide ongoing faculty training in active pedagogy and conduct quality evaluations that consider student engagement in the learning process. This is crucial to ensure that Active Learning can be optimally applied, contributing to the overall improvement of educational quality(Mantha and Krishna 2024).

Overall, the findings emphasize that the learning preferences of Generation Z, which tend to be active and technology-based, can serve as a foundation for designing strategies to improve educational quality. The application of Active Learning, supported by a responsive and adaptive educational management system, has great potential to enhance learning effectiveness and prepare students to face challenges in a complex and technology-driven workforce(Hammad 2025).

The research emphasizes several key implications for improving educational quality through active learning, particularly in response to the needs of Generation Z. One of the primary areas identified is the need for curriculum flexibility and adaptation to accommodate the interactive, technology-based learning preferences of this generation. Generation Z values quick, engaging interactions and real-world applications, making it essential to shift from traditional lecture-based models to more dynamic, participatory approaches. The incorporation of project-based learning, simulations, and collaborative activities is crucial, as it aligns with the preferences of these students. Faculty development in active pedagogy is another critical aspect, ensuring that educators are equipped with the skills and knowledge to facilitate active learning experiences effectively. This includes training in modern teaching techniques, the use of digital tools, and strategies for fostering collaboration(Selfa-Sastre et al. 2022).

Additionally, the integration of technology into learning spaces plays a significant role in supporting active learning. Providing the necessary technological infrastructure, such as online platforms, multimedia tools, and collaborative resources, enhances student engagement and facilitates real-time, interactive learning experiences. However, the successful implementation of active learning also requires a shift in assessment practices. Traditional exams may not fully capture the skills developed through active learning, such as critical thinking and problem-solving. Therefore, a more comprehensive approach to assessment, including project-based evaluations and peer assessments, is necessary to reflect the depth of student engagement and learning(Thaha Abdullateef 2021).

Moreover, continuous evaluation and feedback loops are essential to assess the effectiveness of teaching strategies, the learning environment, and student outcomes. A robust quality assurance system based on participatory learning ensures that educational practices remain adaptive and responsive to students' evolving needs. While much of the existing research has addressed these key areas, additional attention should be given to the mental health and well-being of students in active learning environments, ensuring that these methods do not contribute to unnecessary stress. Furthermore, there is a need for research into the cultural and contextual adaptations of active learning to ensure inclusivity and effectiveness across diverse student populations. Finally, exploring the long-term impact of active learning on career readiness and the role of institutional leadership in supporting these changes will further strengthen the foundation for improving educational quality(Zou et al. 2025).

Discussion

Generation Z's Preference for Interactive and Technology-Based Learning

Generation Z, often referred to as the "digital natives," has grown up in an environment where technology plays a central role in daily life. This generation is accustomed to the constant use of smartphones, social media, and digital platforms, making them highly responsive to technology in the learning process. As a result, their preference for technology-based learning methods is no surprise. Research shows that Generation Z is more engaged when technology is integrated into their educational experiences. For instance, the use of online learning platforms, educational apps, and multimedia content enhances their learning experiences by making lessons more interactive and visually engaging(Onjewu et al. 2025).

The shift towards technology in learning also aligns with their preference for rapid, on-demand access to information. Unlike previous generations that were accustomed to traditional methods of learning such as textbooks and face-to-face lectures, Generation Z prefers the flexibility that digital platforms provide. They value the ability to learn at their own pace and have immediate access to resources like videos, podcasts, and online tutorials. These resources cater to their short attention spans and desire for information in a format that is easy to digest and engaging(Schwieger and Ladwig 2018).

Moreover, the ability to collaborate online using digital tools like forums, video conferencing, and shared documents allows Generation Z to engage in real-time discussions and collaborative learning experiences. This mirrors their preference for group work and peer interaction, which has become an essential part of the modern learning environment. Digital platforms make this kind of interaction easier, breaking down geographical barriers and creating a more inclusive and accessible learning space(Debasu and Yitayew 2024).

One significant benefit of integrating technology into learning is its potential to personalize education. Technology enables the creation of adaptive learning environments where students can access content tailored to their learning pace and style. Generation Z, which thrives in a fast-paced, customized environment, benefits from personalized learning pathways that can help them achieve mastery over subjects at their own speed. This personalization also includes the use of artificial intelligence (AI) to recommend learning resources based on individual performance and preferences(Worsley and Bar-El 2022).

However, the integration of technology in the learning process is not without challenges. There is a need for educational institutions to provide adequate infrastructure and ensure that both students and teachers are equipped to use these tools effectively. Training for faculty members in digital pedagogy and technology integration is essential to ensure that these tools are used in ways that enhance the learning experience rather than detract from it. This highlights the importance of a supportive educational management system that facilitates the effective use of technology in the classroom(Allen et al. 2023).

The Effectiveness of Active Learning in Enhancing Student Engagement and Learning Outcomes

Active learning is a pedagogical approach that emphasizes student engagement through hands-on activities such as discussions, group projects, problem-solving, and simulations. Unlike traditional passive learning methods, where students primarily listen to lectures and take notes, active learning places students at the center of the learning process. Research has shown that active learning significantly enhances student engagement, retention, and academic performance. In particular, it has been found to be highly effective in fields like STEM, where problem-solving and critical thinking are essential(Alkhabra, Ibrahem, and Alkhabra 2023).

One of the key advantages of active learning is that it encourages students to apply the knowledge they acquire in practical contexts. Instead of merely memorizing facts, students engage in activities that require them to think critically, solve problems, and collaborate with others. These experiences help students develop essential skills such as teamwork, communication, and problem-solving, which are highly valued in the workforce. By actively participating in the learning process, students are more likely to retain information and understand its real-world applications(Hebebci and Usta 2022).

Active learning also promotes deeper understanding by encouraging students to reflect on their learning. When students are actively engaged in discussions, simulations, or projects, they are forced to critically analyze and synthesize information. This reflection process strengthens their conceptual understanding and helps them make connections between theoretical knowledge and practical application. As a result, students gain a more comprehensive understanding of the subject matter, which contributes to higher learning outcomes(Topsakal, Yalçın, and Çakır 2022).

Another benefit of active learning is that it caters to diverse learning styles. Some students learn best through visual aids, while others prefer hands-on activities or group discussions. Active learning approaches are versatile and can accommodate these different preferences by offering a range of activities and instructional methods. This inclusivity ensures that all students, regardless of their preferred learning style, can engage with the content in a meaningful way(Oliveira et al. 2025).

Finally, active learning fosters a more engaging and enjoyable learning environment. By incorporating interactive elements like games, debates, and collaborative projects, students are more likely to feel motivated and interested in the material. This increased motivation not only enhances their learning experience but also contributes to higher student satisfaction. The dynamic nature of active learning environments makes them more enjoyable and less monotonous than traditional lecture-based classes, leading to greater overall engagement(Felder and Brent 2024).

The Role of Educational Management in Supporting Active Learning Implementation

While active learning is an effective pedagogical strategy, its successful implementation requires strong support from educational management systems. Educational institutions must provide the necessary infrastructure, resources, and training to ensure that active learning can be integrated seamlessly into the curriculum. This requires a shift in both the management of the curriculum and the development of teaching practices to accommodate the active learning model(Usman, Ali, and Ahmad 2023).

One of the primary responsibilities of educational management is curriculum design. To support active learning, curricula need to be flexible and adaptable to incorporate project-based learning, collaborative activities, and technology-based tools. Educational leaders must prioritize the integration of interactive and student-centered learning methods, ensuring that the curriculum aligns with the needs and preferences of Generation Z. This involves incorporating learning activities that encourage critical thinking, problem-solving, and real-world application, all of which are central to active learning(Andayani and Gunawan 2025).

Faculty development is another crucial aspect of supporting active learning. Teachers need to be equipped with the skills and knowledge to facilitate active learning environments effectively. This includes training in new teaching methodologies, the use of digital tools, and strategies for

fostering collaboration among students. Faculty members must be prepared to adapt their teaching styles to meet the demands of an active learning classroom, which often involves moving away from traditional lecture-based formats to more interactive and engaging activities(Martinez and Gomez 2025).

Additionally, educational management systems must ensure that institutions provide the appropriate technology and learning resources to support active learning. This includes access to digital platforms, collaborative tools, and multimedia resources that enhance the learning experience. Without the necessary infrastructure, such as reliable internet access, learning management systems, and devices, the implementation of active learning may be hindered. Therefore, investments in educational technology are essential for creating an environment where active learning can thrive(Dzaiy and Abdullah 2024).

Finally, the evaluation and assessment of active learning initiatives are critical to their success. Educational management must implement comprehensive evaluation frameworks that assess both the quality of the learning process and the outcomes achieved. This evaluation should focus not only on academic performance but also on factors like student engagement, collaboration, and the development of critical thinking skills. Continuous assessment allows institutions to make data-driven decisions about improving the active learning experience and ensuring its sustainability(Poolsombat, Laisuwannachart, and Phuphaniat 2025).

Personalized Learning Through Technology: The Future of Active Learning

One of the most promising aspects of active learning is its potential for personalization. Generation Z, with its preference for individualized learning experiences, can benefit greatly from personalized learning pathways. Technology plays a crucial role in creating adaptive learning environments where students can receive tailored educational content based on their performance, interests, and learning pace. This level of personalization enhances the learning experience and ensures that each student can engage with the material in a way that suits their needs.

Personalized learning through technology can take various forms, including the use of learning management systems (LMS) that track student progress and recommend resources based on their strengths and weaknesses. Artificial intelligence (AI) is another tool that can be used to analyze student data and provide personalized feedback. For example, AI-powered platforms can suggest relevant articles, videos, or exercises based on a student's learning history, helping them focus on areas where they need improvement.

Moreover, personalized learning can extend beyond the classroom to include real-world experiences and collaborative learning. Technology enables students to work on projects that align with their interests and career goals, providing them with a deeper connection to the subject matter. This approach not only engages students more effectively but also prepares them for future careers by equipping them with skills and knowledge tailored to their specific needs and aspirations.

The flexibility of personalized learning allows students to learn at their own pace, reducing the pressure of keeping up with a traditional classroom schedule. This is particularly beneficial for students who may need extra time to master certain concepts or those who want to accelerate their learning in areas where they excel. By allowing students to take ownership of their learning process, personalized learning fosters a greater sense of autonomy and motivation, which can lead to better academic outcomes.

However, implementing personalized learning on a large scale requires significant investment in technology and training. Educational institutions must ensure that both students and faculty have the tools and resources they need to make personalized learning effective. This includes providing access to learning platforms, creating adaptive learning modules, and offering faculty development programs to help instructors integrate personalized learning strategies into their teaching.

Challenges and Considerations in Implementing Active Learning

Despite its many benefits, the implementation of active learning presents several challenges that need to be addressed. One of the main challenges is the resistance to change from both faculty and students. Traditional lecture-based teaching has been the norm for decades, and shifting to a more interactive and student-centered approach requires a significant change in mindset and teaching style. Faculty members who are accustomed to delivering lectures may be hesitant to adopt new methods, especially if they are not confident in using technology or engaging students in active learning activities.

Another challenge is the resource-intensive nature of active learning. Effective implementation of active learning requires significant investments in technology, classroom space, and faculty development. Educational institutions must provide the necessary infrastructure, such as multimedia equipment, collaborative tools, and digital platforms, to support active learning. Additionally, instructors must receive ongoing training in active pedagogy and be given time to prepare engaging and interactive lessons.

Time constraints are also a factor. Active learning often requires more time for planning, preparation, and facilitation compared to traditional lecture-based methods. Faculty members may find it difficult to allocate sufficient time to develop and execute active learning activities, especially given the demands of a typical academic workload. Furthermore, students may also face challenges in adjusting to more time-consuming, hands-on learning methods that require greater effort and participation.

Assessing the effectiveness of active learning can also be complex. Traditional assessment methods, such as exams and quizzes, may not adequately measure the skills developed through active learning, such as collaboration, problem-solving, and critical thinking. New forms of assessment, such as project-based evaluations, peer assessments, and reflections, need to be developed to capture the full range of competencies that active learning promotes.

Finally, there is the challenge of ensuring equity and accessibility in active learning environments. Not all students have the same level of access to technology or the same learning styles, which may create disparities in learning outcomes. Institutions must ensure that all students, regardless of their socio-economic background, have equal access to the resources and opportunities required for success in an active learning environment. This includes providing digital access, creating inclusive learning materials, and offering support for students who may struggle with more interactive, technology-driven learning methods.

Table 1 Challenges in Implementing Active Learning

Challenge	Description	Solution
Resistance to Change	Faculty and students may be hesitant to adopt active learning due to their familiarity with traditional lecture-based methods. Shifting to a more interactive, student-centered approach requires a significant change in mindset and teaching style.	Provide ongoing training for faculty in active learning techniques and technology integration. Encourage a gradual shift in teaching methods and provide support for faculty to adopt new approaches.
Resource-Intensive Nature	Active learning requires significant investments in technology, classroom space, and faculty development. Institutions need to provide	Invest in technology, classroom resources, and faculty development. Ensure faculty have adequate time for training and preparation of

	multimedia equipment, collaborative tools, and digital platforms to support active learning.	engaging, interactive lessons.
Time Constraints	Active learning requires more time for planning, preparation, and facilitation. Faculty members may struggle to allocate enough time to develop and execute activities due to their academic workload.	Allow for more planning time for instructors to design and implement active learning activities. Offer students more flexible learning schedules to accommodate more time-consuming methods.
Assessment Challenges	Traditional assessment methods like exams may not adequately measure skills developed through active learning. New forms of assessment, such as project-based evaluations and peer assessments, are needed to assess collaboration, problem-solving, and critical thinking.	Develop new assessment methods such as project-based evaluations, peer assessments, and reflections. Focus on assessing the skills developed through active learning.
Equity and Accessibility	Not all students have equal access to technology or the same learning styles, which can lead to disparities in learning outcomes. Institutions must ensure equitable access to resources and support for all students.	Provide equal access to technology and learning resources for all students. Create inclusive materials and offer support for students who struggle with technology-driven learning methods.

Curriculum Flexibility and Adaptation

Traditional, rigid curricula often fail to meet the needs and preferences of Generation Z, who are accustomed to an environment that is heavily influenced by technology and interactivity. This generation, which grew up with smartphones, social media, and a constant flow of information at their fingertips, demands a more engaging and adaptable approach to learning. Generation Z tends to be less interested in passive learning methods such as long lectures or rote memorization and is more drawn to interactive, technology-driven, and real-world learning experiences. As such, traditional curricula, which tend to be fixed and standardized, often fail to effectively engage and motivate these students. In response to this, there is a growing need for significant changes in how curricula are designed to better cater to the evolving needs of this generation.

One of the most important shifts needed is the adoption of more flexible and dynamic approaches to learning. Instead of rigid schedules and standardized content, curricula should allow for a range of learning activities that encourage students to actively participate in the learning process. For example, project-based learning (PBL) has proven to be a highly effective method for engaging students and fostering deep learning. PBL allows students to tackle real-world problems and apply their knowledge in practical ways, thus enhancing their problem-solving skills and critical thinking abilities. Projects can be designed to be interdisciplinary, combining elements

from various subjects to mirror the interconnectedness of knowledge in the real world. For instance, a project-based curriculum might involve students designing a sustainable city, incorporating lessons from science, technology, engineering, and mathematics (STEM), as well as social studies and arts.

Moreover, simulations and role-playing activities provide another powerful tool for curriculum innovation. These methods offer students immersive learning experiences that simulate real-world scenarios, allowing them to experience firsthand the complexities and dynamics of various professions or societal issues. For example, in business or economics education, students could simulate the running of a company, making decisions that impact the bottom line, or engage in mock international negotiations. This type of hands-on learning builds critical skills like teamwork, negotiation, and decision-making, all while keeping students engaged and motivated.

Another key shift is incorporating collaborative learning into the curriculum. Generation Z is highly social and values peer interaction, both in their personal and academic lives. Encouraging collaboration through group projects, discussions, and collaborative problem-solving tasks aligns well with their preferences. It is essential that institutions move away from the solitary, individualistic approach to learning and instead create opportunities for students to learn from and with each other. Group-based learning not only helps students develop communication and teamwork skills but also exposes them to diverse perspectives and ideas. A classroom where students engage in group debates, share insights, and work together on projects fosters a sense of community and enhances the learning experience.

In designing curricula that cater to these needs, institutions must also consider the rapid changes in technology and the evolving demands of the workforce. Today's job market increasingly values skills such as adaptability, digital literacy, creativity, and collaboration—skills that active learning methods, such as PBL, simulations, and collaborative activities, naturally foster. To ensure that curricula are not just relevant but forward-thinking, educational institutions need to embed technology-enhanced learning into the core of their instructional design. This can include the use of online platforms for collaborative work, simulation software for interactive learning experiences, and digital tools that facilitate personalized learning paths. For example, artificial intelligence (AI) can be used to analyze students' learning styles and adapt content to suit individual needs, providing a more personalized and engaging learning experience.

Furthermore, it is crucial for educational institutions to create curricula that respond proactively to the evolving needs of the workforce. As industries continue to change, driven by advancements in technology, globalization, and shifting economic conditions, there is a growing demand for workers who are not only skilled in their specific fields but also adaptable and capable of thinking critically and innovatively. Curricula must be designed to prepare students for the challenges they will face in the workforce by integrating problem-solving, critical thinking, and creative solutions into learning activities. For example, in a STEM-focused curriculum, students might be tasked with designing innovative solutions to address climate change or developing new technologies to solve global health challenges. These types of challenges require the application of knowledge across multiple disciplines, thereby ensuring that students are prepared for complex, real-world problems(Jonker, März, and Voogt 2020).

Technology Integration in Learning

One of the most significant aspects of active learning is the integration of technology in the learning environment, which has become even more crucial as we observe the learning preferences of Generation Z. This generation is highly connected to technology, having grown up with smartphones, social media, and instant access to vast amounts of information. Consequently, it is essential for educational institutions to harness the power of digital tools, collaborative platforms, and multimedia content to create an interactive and engaging learning environment that resonates with this tech-savvy cohort. For Generation Z, technology is not just an add-on to learning; it is an integral part of how they engage with content, solve problems, and interact with others.

The integration of technology facilitates a more flexible, interactive, and personalized learning experience. For instance, digital tools such as interactive whiteboards and online platforms like Google Classroom allow educators to present lessons in dynamic ways that encourage student participation. These platforms can integrate multimedia content such as videos, podcasts, and infographics that cater to various learning styles, making the material more accessible and engaging. For example, a history lesson might include a video tour of ancient Roman ruins, interactive maps, and short documentaries, enabling students to explore the material in a way that a traditional textbook cannot. By incorporating various forms of media, students can engage with the content in different ways—visually, auditorily, and kinesthetically—which enhances their understanding and retention of the material.

Moreover, technology enables students to engage with content at their own pace, offering more flexibility in the learning process. Platforms such as online learning management systems (LMS) like Moodle or Blackboard provide students with the ability to access course materials anytime and from anywhere, enabling them to revisit lessons, engage with additional resources, and review content before exams. This flexibility is particularly beneficial for students who may need extra time to fully grasp certain concepts or for those who wish to challenge themselves with advanced content beyond the scope of the regular curriculum. For example, a student struggling to understand a difficult math concept can watch tutorial videos, take quizzes to test their understanding, and ask questions on online discussion forums, all without the time pressure of a classroom setting.

Another key advantage of integrating technology in active learning is the collaboration it fosters. Collaborative platforms such as Google Docs, Microsoft Teams, and Slack allow students to work together on projects in real-time, even if they are not physically in the same location. These tools enable students to share ideas, create documents, and participate in group discussions, making it easier for them to work together on assignments and projects. For example, a group of students working on a science project about renewable energy could use Google Docs to collaboratively write their report, while using a shared Google Slides presentation to build their findings. In this environment, students are not just passive learners; they are active participants who contribute to the learning process and gain valuable skills in teamwork and communication—skills that are essential in today's workforce.

However, the successful integration of technology into the learning environment does not happen automatically. It requires careful planning and investment from educational institutions. One of the key components for effective technology-enhanced learning is ensuring that the necessary infrastructure is in place. This includes providing reliable internet access, ensuring that students and faculty have access to devices such as laptops, tablets, or smartphones, and equipping classrooms with the necessary technological tools, such as interactive projectors, microphones, and sound systems. For example, schools in rural or underserved areas may face challenges in providing adequate internet access or devices for students, which could limit their ability to fully participate in a technology-enhanced learning environment. Therefore, institutions must ensure that they are addressing these disparities to create equitable learning opportunities for all students.

In addition to infrastructure, faculty and student readiness for using technology effectively is essential. Simply providing digital tools and platforms is not enough. Teachers must be equipped with the skills and confidence to use these tools to their full potential. This means investing in faculty training programs that focus on digital pedagogy, the use of technology in teaching, and how to effectively integrate digital tools into their lesson plans. For example, workshops on using interactive quizzes, setting up discussion boards, or creating digital assignments can help educators feel more comfortable using these tools in their classrooms. Similarly, students also need to be trained on how to use the technology in a way that supports their learning, such as understanding how to navigate learning management systems or engage with online resources effectively.

Moreover, technology integration should go beyond merely using digital tools for content delivery. It should involve rethinking the entire learning experience to ensure that it is immersive, interactive, and participatory. One example of this is the use of gamification in learning. Platforms like Kahoot! or Quizlet allow students to engage with learning material through games

and quizzes that provide instant feedback, making learning more fun and competitive. This kind of approach encourages students to actively engage with the material, rather than passively consuming information.

Finally, the importance of continuous feedback and assessment in a technology-driven learning environment cannot be overstated. Digital platforms enable real-time feedback, which allows students to track their progress and make improvements as they go. For instance, using tools like Edmodo or Turnitin, teachers can provide instant feedback on assignments, allowing students to revise their work and improve before submission. This kind of immediate feedback loop fosters a more dynamic and personalized learning experience that traditional assessment methods often lack (Rintaningrum 2023).

Active Learning as a Transformative Approach to Improving Educational Quality

Active learning is an approach that positions students as active subjects in the learning process. This approach includes activities such as discussions, problem-based learning, case studies, group presentations, and project-based learning. Active learning has been shown to significantly enhance student engagement, knowledge retention, and 21st-century skills such as critical thinking, collaboration, and communication (Freeman et al., 2014). However, the transformative impact of active learning on educational quality can only be achieved if it is supported by adaptive educational management that is responsive to changes in student characteristics, technology, and the demands of the workforce.

Leverage Aspects for Improving Educational Quality through Active Learning:

1. Adaptive Curriculum Planning

    - The curriculum should be designed based on learning outcomes, not just content.
    - Flexibility is needed to accommodate project-based learning models, open discussions, and contextual learning.
    - Educational management must ensure the curriculum is dynamic and aligned with the needs of Gen Z and global demands.

2. Faculty Competence Development

    - Faculty, as facilitators, must be equipped with training in active pedagogy, digital literacy, and instructional design.
    - The application of active learning will be more effective if faculty are capable of managing interactive classes and providing meaningful feedback.

3. Infrastructure and Technology

    - Interactive classroom facilities, good internet access, and digital learning platforms are essential.
    - Learning Management Systems (LMS), collaborative tools (such as Padlet, Jamboard, Mentimeter), and learning apps should be provided and supported by the institution.

4. Learning Quality Assurance System

    - Quality evaluation should not focus solely on final grades but also on the learning process, student engagement, and reflective learning.
    - Internal quality audits should assess the implementation of active learning models as part of the educational process standards.

5. Transformational Leadership

- Institutional leaders need to be agents of change, driving a culture of innovation in teaching and learning.
- A participative leadership style that is open to initiatives from faculty and students plays a crucial role in the successful implementation of active learning.

6. Authentic Learning Assessment

- The assessment system should reflect critical thinking, teamwork, and problem-solving processes, not just rote memorization.
- Formative assessments, portfolios, and project presentations are important elements of active learning.

Conclusion

In conclusion, the integration of Active Learning into higher education, particularly in response to the learning preferences of Generation Z, offers significant potential to enhance student engagement, learning outcomes, and critical thinking skills. Generation Z's preference for interactive, technology-driven, and collaborative learning aligns well with the principles of active learning, which encourages hands-on participation, real-world application, and personalized learning experiences. However, the successful implementation of active learning requires strong support from educational management systems, including flexible curriculum planning, faculty development, and the provision of necessary technological infrastructure. Despite the challenges, such as resistance to change and resource constraints, active learning represents a transformative approach that can significantly improve the quality of education when supported by adaptive and responsive educational management practices.

Active learning will only have a significant impact on educational quality if it is systematically supported by adaptive educational management practices: from curriculum planning, faculty competence development, infrastructure strengthening, to process-based evaluation. The synergy between the learning approach and the quality management of education is the key leverage in realizing higher education that is relevant, of high quality, and sustainable.

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