How to Cite:
Minh, B. T. H. (2024). Application of new technologies in innovating teaching methods at universities. *Tennessee Research International of Social Sciences*, *6*(2), 209–220. Retrieved from https://triss.org/index.php/journal/article/view/69

Application of new technologies in innovating teaching methods at universities

Bui Thi Hong Minh
Ha Noi Metropolitan University, Hanoi city, Viet Nam
Corresponding Email: bthminh@daihocthudo.edu.vn

Abstract---This study delves into the utilization of emerging technologies to revolutionize pedagogical approaches within tertiary institutions. Through the amalgamation of inventive teaching methodologies and judicious deployment of technological tools, it underscores a marked enhancement in academic proficiency and skill acquisition among students. Extant research underscores that the amalgamation of Information and Communication Technologies (ICTs) within university academia fosters heightened engagement between educators and learners, thereby engendering an environment conducive to profound learning experiences. Moreover, the incorporation of educational technology bolsters educators' confidence and instructional efficacy through the deployment of pioneering resources and platforms. Nonetheless, the adoption of innovative teaching methods encounters impediments including faculty resistance, deficient technological infrastructure, and concerns regarding inclusivity and accessibility. To surmount these challenges, educational institutions must institute strategic initiatives encompassing faculty training, infrastructural investments, and the establishment of robust support frameworks. In summation, the integration of technology in educational practices not only augurs well for elevating academic standards but also serves as a linchpin for fostering transformative change and sustainable growth within higher education throughout the 21st century.

Keywords---Innovative teaching methods, Educational technology, Higher education, Technology integration, Learning quality.

1. Introduction

The integration of new technologies into teaching methodologies has become a focal point in higher education, prompting institutions to reassess traditional

Tennessee research international of social sciences © 2024.
ISSN: 2766-7464 (Online)
Publisher: Smoky Mountain Publishing
Manuscript submitted:03 July 2024, Manuscript revised: 25 August 2024, Accepted for publication: 07 Sept 2024

pedagogical approaches. This transformation is driven by the need to enhance student engagement, facilitate personalized learning, and prepare graduates for a technologically advanced society. In recent years, numerous studies have highlighted the potential benefits and challenges associated with the use of technology in teaching and learning environments (Nguyen, 2016; Thang, 2016; Vajargah, Jahani, & Azadmanesh, 2010).

Technological advancements have introduced a range of tools and platforms that support various educational activities, from content delivery and assessment to collaboration and communication. For instance, Nguyen (2016) emphasizes the significant impact of information technology on foreign language teaching, illustrating how international experiences can inform and improve practices in Vietnam. Similarly, Thang (2016) discusses the management aspects of technology application in university teaching, underscoring the administrative and infrastructural considerations necessary for successful implementation.

Despite the recognized advantages, the adoption of technology in higher education is not without its challenges. Hooper and Rieber (1995) note that the effectiveness of teaching with technology depends on how well it is integrated into the curriculum and the pedagogical strategies employed by educators. Additionally, Price and Kirkwood (2014) provide a critical review of how evidence can inform the use of technology in teaching and learning, highlighting the need for robust research to guide practice.

The resistance to technological adoption among some educators is another critical issue. Shelton (2017) explores the reasons why some university lecturers may discontinue using technology, citing factors such as inadequate training, perceived irrelevance, and the complexity of integrating new tools into existing teaching practices. This resistance can impede the broader institutional efforts to modernize education and fully realize the benefits of technological innovations.

Moreover, the impact of educational technologies on teachers' self-efficacy is a crucial consideration. Saienko, Lavrysh, and Lukianenko (2020) examine how the use of technology influences university teachers' confidence in their teaching abilities, suggesting that appropriate support and professional development are essential for fostering positive attitudes towards technology.

Therefore, while the application of new technologies holds promise for enhancing teaching and learning in higher education, it requires careful planning, ongoing support, and a commitment to evidence-based practices. This paper aims to explore the various dimensions of technological integration in university teaching, drawing on contemporary research and case studies to provide insights and recommendations for educators and policymakers.

2. Theoretical Foundation

2.1. Concept of Innovating Teaching Methods

Innovating teaching methods involves the integration of new strategies and technologies to enhance the educational experience and effectiveness. According to Nguyen (2016), innovation in teaching practices can be driven by the

application of information technology, which has been shown to significantly improve foreign language instruction. This assertion is supported by international experiences and practical applications within Vietnam's educational context (Nguyen, 2016).

Furthermore, Thang (2016) highlights the importance of managing the application of information technology in university teaching, emphasizing that effective management is crucial for the successful integration of new teaching methods (Thang, 2016). Vajargah, Jahani, and Azadmanesh (2010) also discuss the use of ICT in higher education, demonstrating that technological applications can enhance both teaching and learning processes (Vajargah et al., 2010).

Hooper and Rieber (1995) argue that teaching with technology requires educators to rethink traditional pedagogical approaches to create more engaging and interactive learning environments (Hooper & Rieber, 1995). Similarly, Price and Kirkwood (2014) critically review how evidence-based practices inform the use of technology in higher education, suggesting that a reflective and well-informed approach is necessary for effective technology integration (Price & Kirkwood, 2014).

Moreover, the challenges and resistance to adopting new technologies in teaching are also noteworthy. Shelton (2017) explores why some university lecturers abandon technology and social media, citing issues such as a lack of support and the need for professional development (Shelton, 2017). Saienko, Lavrysh, and Lukianenko (2020) examine the impact of educational technologies on university teachers' self-efficacy, indicating that proper training and resources are essential for fostering confidence and proficiency in using new technologies (Saienko et al., 2020).

Eady and Lockyer (2013) provide practical insights into the tools available for learning, underscoring the potential of technology to transform teaching practices in primary education and beyond (Eady & Lockyer, 2013). Finally, Sampson et al. (2018) discuss sustainable digital innovations that improve teaching and learning, advocating for a continuous and evolving approach to educational technology (Sampson et al., 2018).

By examining these perspectives and studies, we gain a comprehensive understanding of the concept and practical implications of innovating teaching methods in higher education.

2.2. Modern Educational Models

Modern educational models have evolved significantly to address the dynamic needs of contemporary learners. These models emphasize active engagement, technology integration, and practical application of knowledge. This section introduces several modern educational models, including project-based learning, blended learning, and experiential learning.

Project-Based Learning (PBL)

Project-Based Learning (PBL) is an instructional methodology that encourages students to learn by actively engaging in real-world and personally meaningful projects. PBL shifts the traditional teaching paradigm from a teacher-centered model to a learner-centered approach, fostering critical thinking, collaboration, and problem-solving skills. Nguyen (2016) emphasizes that PBL not only enhances student motivation and engagement but also helps in developing practical skills that are essential in the modern workforce.

Blended Learning

Blended Learning combines traditional face-to-face instruction with online learning activities, creating a hybrid model that leverages the benefits of both approaches. This model provides flexibility, allowing students to access learning materials at their own pace and convenience while still benefiting from direct interaction with instructors and peers. Thang (2016) highlights the role of information technology in facilitating blended learning, particularly in higher education institutions, where it has been shown to improve learning outcomes and student satisfaction.

Experiential Learning

Experiential Learning is a process through which students develop knowledge, skills, and values from direct experiences outside a traditional academic setting. This model is based on the principle that students learn more effectively when they are actively involved in the learning process. Vajargah, Jahani, and Azadmanesh (2010) note that experiential learning is particularly effective in higher education, where practical application of theoretical concepts is crucial for professional development.

Integration of Technology in Modern Educational Models

The integration of technology is a common theme across all modern educational models. Technology facilitates access to information, enhances communication, and supports innovative teaching practices. Hooper and Rieber (1995) discuss the transformative potential of technology in education, arguing that it can create more interactive and engaging learning environments. Additionally, Price and Kirkwood (2014) critically review the impact of technology on teaching and learning in higher education, stressing the importance of evidence-based practices to inform the effective use of technology in educational settings.
\Hence, contemporary educational frameworks like Project-Based Learning, Blended Learning, and Experiential Learning epitomize noteworthy progressions in pedagogical paradigms. These models prioritize active engagement, adaptability, and real-world application, bolstered by the infusion of technology. Their incorporation into higher education is propelled by the imperative to equip students with the competencies and insights indispensable for navigating an ever-evolving landscape successfully.

3. Application of Technology in Teaching

3.1. Online Teaching (E-learning)

Online teaching, often referred to as e-learning, has become increasingly prevalent in educational settings due to advancements in technology. This mode of instruction utilizes various online platforms and tools to deliver educational content and facilitate learning experiences. The utilization of online teaching platforms offers several benefits:

Flexibility: E-learning provides flexibility in terms of time and location, allowing students to access learning materials and participate in activities at their convenience. This flexibility is particularly advantageous for learners with busy schedules or those who prefer self-paced learning.

Accessibility: Online teaching breaks down geographical barriers, making education more accessible to a diverse range of learners. Students from different locations can engage in the same course without the need to commute to a physical classroom, promoting inclusivity and diversity in education.

Interactive Learning: Many e-learning platforms incorporate interactive features such as multimedia content, discussion forums, and quizzes to engage learners and enhance their understanding of the subject matter. Interactive elements can promote active participation and collaboration among students, fostering a dynamic learning environment.

Personalized Learning: E-learning platforms often allow instructors to customize learning materials and assessments based on individual student needs and preferences. Personalized learning experiences can cater to diverse learning styles and promote greater student engagement and motivation.

Cost-Effectiveness: Online teaching can be a cost-effective alternative to traditional classroom-based instruction, as it eliminates expenses associated with physical facilities, commuting, and printed materials. Additionally, e-learning can accommodate a larger number of students without requiring additional resources, making it a scalable solution for educational institutions.

Data Analytics: E-learning platforms often feature built-in analytics tools that enable instructors to track student progress, assess learning outcomes, and identify areas for improvement. Data-driven insights can inform instructional decisions and facilitate continuous improvement in teaching practices.

Lifelong Learning: E-learning supports lifelong learning by providing opportunities for individuals to acquire new knowledge and skills at any stage of their lives. Whether for professional development, career advancement, or personal enrichment, online teaching offers accessible pathways for lifelong learners to pursue their educational goals.

Thus, online teaching presents a multitude of advantages that enhance the efficacy, accessibility, and inclusivity of education. Through the utilization of technology and pioneering pedagogical approaches, e-learning holds the promise

of revolutionizing conventional teaching methodologies and empowering learners across varied educational settings.

3.2. Blended Learning

Blended learning, also known as hybrid learning, is a pedagogical approach that combines traditional face-to-face instruction with online learning activities. This model offers a flexible and dynamic learning environment by integrating the strengths of both offline and online methods.

Blended learning allows educators to leverage various online tools and platforms, such as learning management systems (LMS), educational apps, multimedia resources, and interactive simulations. By incorporating these digital resources, instructors can enhance engagement, facilitate self-paced learning, and provide personalized feedback to students.

The effectiveness of blended learning has been widely studied and documented in educational research. Studies have shown that this approach can lead to improved learning outcomes, increased student satisfaction, and greater flexibility in course delivery. Furthermore, blending online and offline activities promotes active learning, collaborative problem-solving, and critical thinking skills.

However, successful implementation of blended learning requires careful planning, instructional design, and ongoing support for both educators and students. It is essential to consider factors such as course content, learning objectives, technological infrastructure, and student accessibility when designing blended learning experiences.

Therefore, blended learning presents a compelling strategy for modernizing education through the fusion of technology with conventional teaching methods. By amalgamating the strengths of both approaches, educators have the opportunity to craft immersive and impactful learning opportunities that cater to the multifaceted needs of contemporary learners.

3.3. Virtual Reality and Augmented Reality Utilization

Virtual Reality (VR) and Augmented Reality (AR) technologies have revolutionized teaching practices by providing immersive and interactive learning experiences. VR creates a simulated environment that users can interact with, while AR overlays digital content onto the real world.

In education, VR and AR applications are diverse and impactful. VR simulations allow students to explore complex concepts in subjects like science, engineering, and medicine by providing hands-on experiences in virtual environments. For example, medical students can practice surgical procedures in a realistic VR environment, enhancing their skills and confidence before operating on real patients.

AR enhances traditional learning materials by adding interactive digital elements. For instance, AR textbooks can display 3D models of historical landmarks or

scientific phenomena, making abstract concepts more tangible and engaging for students. Moreover, AR apps can overlay additional information onto physical objects, such as museum exhibits or architectural structures, enriching the learning experience.

The benefits of VR and AR in education are manifold. These technologies foster active learning by encouraging exploration, experimentation, and problem-solving. They also cater to different learning styles and preferences, providing personalized and adaptive learning experiences. Additionally, VR and AR enhance student motivation and engagement by making learning more interactive, immersive, and fun.

Furthermore, VR and AR facilitate collaboration and communication among students and educators. Virtual classrooms and collaborative VR environments enable remote learners to interact with peers and instructors in real-time, transcending geographical barriers and promoting global connectivity. Similarly, AR apps can support group activities and project-based learning by allowing students to collaborate on interactive tasks and presentations.

Overall, VR and AR technologies hold immense potential to transform education by making learning more accessible, engaging, and effective. As these technologies continue to evolve and become more accessible, they are likely to play an increasingly significant role in shaping the future of teaching and learning.

4. Benefits of Innovative Teaching Methods

4.1. Enhancing Learning Quality

In recent years, there has been a growing recognition of the importance of implementing innovative teaching methods to enhance the quality of learning in higher education. By leveraging various pedagogical approaches and integrating technology effectively, educators can significantly improve the learning outcomes of their students.

Research conducted by Nguyen (2016), Thang (2016), and Vajargah et al. (2010) has highlighted the positive impact of information and communication technologies (ICTs) on teaching and learning at the university level. These technologies offer diverse tools and resources that cater to different learning styles and preferences, thereby promoting active engagement and deep understanding among students.

Furthermore, studies by Hooper and Rieber (1995), Price and Kirkwood (2014), and Shelton (2017) emphasize the importance of embracing technology in teaching practices. They suggest that by incorporating digital tools such as virtual reality (VR), augmented reality (AR), and interactive simulations, educators can create immersive learning experiences that captivate students' interest and facilitate knowledge retention.

Moreover, Saienko et al. (2020) found that educational technologies can enhance teachers' self-efficacy, leading to more effective instructional strategies and

increased student satisfaction. By providing educators with innovative tools and training opportunities, institutions can empower them to design dynamic learning environments that cater to diverse student needs and preferences.

Overall, the adoption of new teaching methods, particularly those supported by technology, holds great promise for enhancing the quality of learning in higher education. By leveraging evidence-based practices and staying abreast of emerging trends, educators can create transformative learning experiences that prepare students for success in the 21st century.

4.2. Developing 21st Century Skills

In the rapidly evolving landscape of higher education, the cultivation of 21st-century skills has become a priority for educators aiming to prepare students for success in an increasingly complex and interconnected world. Innovative teaching methods play a crucial role in fostering the acquisition and refinement of these skills, empowering students to thrive in diverse academic and professional contexts.

Research by Sampson et al. (2018) and Eady and Lockyer (2013) underscores the importance of integrating digital technologies into teaching practices to promote skill development. By leveraging online collaboration tools, multimedia resources, and interactive platforms, educators can create authentic learning experiences that encourage students to think critically, communicate effectively, and collaborate productively.

Furthermore, studies by Blin and Munro (2008) and Draeger and Price (2011) highlight the transformative potential of active learning strategies such as problem-based learning (PBL) and project-based learning (PjBL). These pedagogical approaches provide students with opportunities to apply theoretical knowledge to real-world challenges, fostering the development of problem-solving skills, creativity, and resilience.

Moreover, the work of Andresen (2000) and Brau and Clarke (2006) emphasizes the importance of fostering a supportive learning environment that encourages risk-taking and experimentation. By promoting a growth mindset and providing constructive feedback, educators can empower students to take ownership of their learning journey and develop a lifelong commitment to continuous improvement.

Overall, innovative teaching methods offer a powerful platform for cultivating the essential skills needed for success in the 21st century. By embracing evidence-based practices and leveraging the affordances of technology, educators can inspire students to become lifelong learners, critical thinkers, and effective communicators who are equipped to navigate the complexities of an ever-changing world.

4.3. Enhancing Interaction Between Lecturers and Students

Effective interaction between lecturers and students is fundamental to the

learning process, facilitating knowledge acquisition, skill development, and critical thinking. In recent years, the advent of innovative teaching methods has opened up new possibilities for enhancing interaction and fostering a dynamic learning environment.
Research by Shelton (2017) and Saienko et al. (2020) sheds light on the role of technology in promoting interaction between lecturers and students. While digital tools such as online forums, video conferencing, and interactive multimedia resources have the potential to enrich communication and collaboration, it is essential to strike a balance between technology-mediated interactions and face-to-face engagement to ensure inclusivity and accessibility for all students.

Moreover, the work of Price and Kirkwood (2014) and Hooper and Rieber (1995) underscores the importance of active learning strategies in promoting meaningful interaction in the classroom. By incorporating group discussions, peer feedback activities, and collaborative projects into their teaching practices, educators can create opportunities for students to engage with course content, exchange ideas, and construct knowledge collaboratively.

Furthermore, studies by Nguyen (2016) and Vajargah et al. (2010) highlight the significance of learner-centered approaches in fostering interaction and engagement. By adopting a pedagogical framework that prioritizes student agency, autonomy, and participation, lecturers can empower students to take ownership of their learning process, ask questions, and contribute to class discussions actively.

Overall, the integration of new teaching methods offers promising avenues for enhancing interaction and student engagement in higher education. By embracing a diverse range of pedagogical strategies and leveraging the affordances of technology, educators can create dynamic learning environments that foster collaboration, critical inquiry, and lifelong learning.

5. Challenges and Solutions

5.1. Challenges in Technology Adoption

Integrating new technologies into educational practices poses numerous challenges for universities, requiring careful navigation and proactive strategies to overcome. Some of the prominent hurdles faced in this endeavor include:

Resistance to Change: Faculty and staff may exhibit reluctance or resistance towards embracing new technologies, stemming from concerns about disrupting established teaching methods, fear of technological complexity, or apprehension regarding their own proficiency in using these tools.

Limited Technical Proficiency: A significant portion of faculty members and staff may lack the requisite technical skills and knowledge to effectively utilize advanced educational technologies, leading to barriers in implementation and utilization.

Infrastructure Limitations: Inadequate technological infrastructure, such as outdated equipment, insufficient network bandwidth, and inadequate support

systems, can impede the seamless integration and utilization of technology in teaching and learning environments.

Financial Constraints: The financial costs associated with acquiring, implementing, and maintaining educational technologies, as well as providing necessary training and support, may strain university budgets and resources, posing a significant challenge for widespread adoption.

Equity and Accessibility Concerns: Ensuring equitable access to technology for all students, regardless of socioeconomic background or physical abilities, presents a complex challenge for universities, necessitating proactive measures to address accessibility issues and bridge the digital divide.

Navigating these challenges requires a multifaceted approach, encompassing stakeholder engagement, strategic planning, and targeted interventions to address the diverse barriers to technology adoption. By recognizing and addressing these challenges head-on, universities can pave the way for the effective integration of technology into teaching and learning practices, ultimately enhancing the quality and accessibility of education for all stakeholders.

5.2. Overcoming Solutions:

To surmount the challenges associated with technology adoption in higher education, universities must implement proactive solutions and strategic initiatives aimed at fostering a culture of innovation and technological integration. Key strategies to overcome these challenges include:

Faculty Training and Professional Development: Providing comprehensive training programs and professional development opportunities for faculty members and staff to enhance their technical proficiency and pedagogical skills in utilizing educational technologies effectively.

Investment in Infrastructure: Allocating adequate resources and funding to upgrade and maintain technological infrastructure, including hardware, software, and network systems, to ensure optimal performance and support for technology-enhanced teaching and learning activities.

Development of Support Services: Establishing robust support services, such as help desks, technical support teams, and online resources, to provide timely assistance and troubleshooting for faculty, staff, and students encountering technical difficulties or challenges in utilizing educational technologies.

Curriculum Redesign and Content Development: Collaborating with instructional designers and subject matter experts to redesign curricula and develop engaging, interactive digital content that leverages the capabilities of educational technologies to enhance student learning outcomes and engagement.

Accessibility and Inclusivity Initiatives: Implementing initiatives to promote accessibility and inclusivity in technology-enhanced learning environments, including ensuring compatibility with assistive technologies, providing alternative

formats for content delivery, and raising awareness about accessibility best practices among faculty and staff.

By adopting a holistic approach that combines these solutions with ongoing assessment, feedback mechanisms, and continuous improvement efforts, universities can effectively address the challenges of technology adoption and harness the transformative potential of educational technologies to enrich the teaching and learning experience for all stakeholders.

6. Conclusion

In conclusion, the integration of innovative teaching methods facilitated by advancements in technology offers immense potential for enhancing the quality of higher education. Through the exploration of various pedagogical approaches and the utilization of digital tools and resources, universities can create dynamic learning environments that cater to the diverse needs and preferences of students. The benefits of this transformation are multifaceted, ranging from improved learning outcomes and the development of essential 21st-century skills to enhanced faculty-student interactions and engagement.

However, this journey towards educational innovation is not without its challenges. Universities must navigate obstacles such as faculty resistance, inadequate infrastructure, and accessibility barriers to successfully implement technology-enabled teaching strategies. Nevertheless, by investing in faculty training, infrastructure development, and curriculum redesign, institutions can overcome these challenges and unlock the full potential of educational technologies.

Moving forward, it is essential for universities to embrace a culture of continuous improvement and innovation, fostering collaboration and knowledge sharing among faculty, staff, and students. By leveraging evidence-based practices and staying abreast of emerging trends in educational technology, institutions can adapt to the evolving needs of learners and remain at the forefront of educational excellence.

In essence, the transformative power of technology in higher education lies not only in its ability to revolutionize teaching and learning but also in its capacity to empower individuals and drive positive change. As we continue to harness the potential of educational technologies, let us remain committed to the pursuit of excellence, inclusivity, and lifelong learning in service of our collective educational aspirations.

References

[1] Andresen, L., 2000. *College teaching goes online.* Change: The Magazine of Higher Learning, 32(5), 34-38.

[2] Blin, F., & Munro, M., 2008. *Why hasn't technology disrupted academics' teaching practices? Understanding resistance to change through the lens of activity theory.* Computers & Education, 50(2), 475-490.

[3] Draeger, J., & Price, L., 2011. *Students' perceptions on the integration of online components to a traditional course.* TechTrends, 55(6), 43-51.
[4] Eady, M., & Lockyer, L., 2013. *Tools for learning: Technology and teaching.* In Learning to Teach in the Primary School, 71.
[5] Hooper, S., & Rieber, L. P., 1995. *Teaching with technology.* In Theory into Practice, 2013, 154-170.
[6] Nguyen, V. L., 2016. *Application of information technology in foreign language teaching: From international experiences to the reality in Vietnam.* VNU Journal of Science: Education Research, 32(2).
[7] Price, L., & Kirkwood, A., 2014. *Using technology for teaching and learning in higher education: A critical review of the role of evidence in informing practice.* Higher Education Research & Development, 33(3), 549-564.
[8] Saienko, N., Lavrysh, Y., & Lukianenko, V., 2020. *The impact of educational technologies on university teachers' self-efficacy.* International Journal of Learning, Teaching and Educational Research, 19(6), 323-336.
[9] Sampson, D., Ifenthaler, D., Spector, J. M., & Isaías, P. (Eds.). 2018. *Digital technologies: Sustainable innovations for improving teaching and learning.* Cham: Springer.
[10] Shelton, C., 2017. *Giving up technology and social media: Why university lecturers stop using technology in teaching.* Technology, Pedagogy and Education, 26(3), 303-321.
[11] Thang, N. Y., 2016. *Management of information technology application in teaching at universities.* Journal of Educational Science, 130, 30-33.
[12] Vajargah, K. F., Jahani, S., & Azadmanesh, N., 2010. *Application of ICTs in Teaching and Learning at University Level: The Case of Shahid Beheshti University.* Turkish Online Journal of Educational Technology-TOJET, 9(2), 33-39.