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Leveraging Artificial Intelligence: Applications To Enhance Learning Experiences In Higher Education: Transforming Pedagogical Practices For The 21st Century

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Abstract:

Teaching and learning, changed by electronic technology, are the foundations of contemporary education. The introduction of innovative technologies (e.g., artificial intelligence, virtual reality, and adaptive learning systems) altered the classic classroom environment . The objectives of the study were; (1) What are impacts of emerging techniques AI, virtual reality and adaptive learning on learner engagement, critical thinking skills and knowledge retention in education in 21st century? (2) What were the various applications for integrating technology in designing curriculum efficiently with personalized student-centered learning agile methodologies? (3) [1]How do university teachers see about using emerging educational elements? All the male and female teachers and students of the National University of Modern Languages (NUML) Multan constituted the population. A total number of 15 university teachers and 70 students were taken with a self-devised questionnaire developed for data collection . used random sampling techniques for this sample. The analysis techniques utilized SPSS version 21, and calculation of frequency, percentage, mean scores, and standard deviation using t-tests for independent samples were done to measure the results of the study. With these technological tools, learning environments became even more individualized, interactive, and student-oriented. The research focused on the latest improvements in educational technologies and how it affects learner interest, critical thinking, and remembering knowledge. This study also addressed challenges related to digital equity and teacher training in adopting these tools, offering insights into best practices for overcoming barriers. According to the study, innovative technologies had significant potential to improve educational outcomes and experiences through strategic use of technology, equipping students for their future in a digital world.

Keywords: *Artificial Intelligence, Learning Experiences, Higher Education.*

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Introduction

Learning and study approaches of students within the classroom, however, has been strongly affected in recent years due to the technological and pedagogic advances in the field. The use of artificial intelligence and virtual reality by the modern system is pushing forth a more individualized and even interactive learning setup. With students increasingly relying on digital tools as part of academic and social behavior, studies to understand the various impacts of those tools on classroom engagement, thought, and persistent learning have continued to gain so much interest within the recent scholarly literature (Fawns, 2021).

Consistent with the overall movement towards a more student-centered approach to learning scaffold, there has been a growing use of AI driven systems, virtual learning environments and adaptive technology (Johnson et al, 2020). Although these advances provide an advantage, they also raise obligations to educators who now have to adapt to new modes of teaching and learning and the learning of new technologies, while additionally dealing with qualifiers such as digital access and equity (Selwyn 2018).

This research attempts to fill this gap by studying how emerging technologies affect learner engagement and critical thinking, and the barriers to adoption of these tools that educators face. The research hopes to provide insight into how to better utilize emerging technologies to develop learning experiences that have a lasting and personalized impact on students.

This has been one of the key focal points in educational research, highlighting their potential and challenges. Artificial intelligence applications are transformative in the education field, especially because of their ability to bring about personalized learning through data analysis of learners to automatically adapt content and assessment tasks for each student in real-time (Holmes et al., 2021). It was reported that AI in education enhances personalized instruction as it can adjust content dynamically, thus making learners more engaged (Siau and Wang, 2020). VR technologies give students experiences of immersive environments that enable learners to comprehend complex ideas better and give learners a hands-on experience of the concept being learned. In one study, VR was shown to improve the knowledge retention, as the content was learned directly by the learners in the VR environment, allowing the learners to learn a new skill as well as understand this learned concept (Radianti et al., 2020).

These are new pathways being opened by this technology but are a significant challenge for educators to incorporate in the existing learning program. One of the most important concerns about digital learning is that it may not be equitable for students from less fortunate backgrounds, due to the perceived lack of access to appropriate technology (Eynon & Malmberg, 2018). Research conducted by Williamson & Hogan (2020) reports that teacher training on the emerging technologies is not being done effectively which is a major hitch for their smooth integration; hence, teachers must be provided the required assistance to fit the tools into their pedagogical practices.

Presently, things in schools are moving in a new direction which is mostly affected by the personal and technology world. For example, interactive platforms are replacing old ways of teaching. While this change is on the rise, it will surely finally settle on a student-centered, tech-infused, personalized learning style. Schmid et al. (2021) indicate that adaptive learning systems enhance student motivation and performance, as students can learn at their own pace and in a style that best suits them, which follows constructivist learning theories' principle of an active student involvement in the learning process. However the literature wants to show us, that comprehensive strategies and policy frameworks are necessary to handle digital learning technologies challenges.

These discoveries will be applied to a deeper understanding on how these technologies affect the learning outcome and offering best methods to integrate them, plus also we have to consider the possible difficulties that may occur to educators and students.

Statement of the Problem

To stay current with 21st-century technology development, new ways technologies could be applied, such as artificial intelligence, virtual reality and adaptive learning modalities, have been shown to possess the power to significantly contribute to enhanced learning outcomes. Despite the ability of these technologies to contribute to the development of more personal, student-focused learning, for the practitioner and for institutions, there are deep obstacles to the application of these technologies. Underlying issues that deserve consideration are the impact of these technologies on learner engagement, critical thinking and retention but also how these technologies can be integrated in the curriculum to ensure it is inclusive and interactive (KuriakoseLengedijk, 2023).

Moreover, these technologies are not always implemented at scale due to the lack of teacher professional development and supporting ecosystem. In addition, students from different socio-economic backgrounds face their own challenges associated with digital equity and access. Educators at NUML university using the new technologies to create the educational experience & teacher's learning/innovation and scientific discovery (Johnson & Ferrar, 2023) and thus must be adequately equipped.

This project responds to the critical need to investigate the influence of emerging technologies on learning and identify best practices for the barriers that educators face in the implementation of these emerging technologies. The aim is to shed light on important insights concerning strategic implementation in AI, VR, and adaptive learning systems in higher education to prepare students with the skills needed to work in a world where everything is getting more digitalized.

Rationale of the Study

One of the rapidly changing trends in educational institutions is the development of artificial intelligence (AI), virtual reality (VR), and personalized learning systems such as adaptive learning systems. These tools are intended to transform the methods of teaching and learning in a broader level of innovation. These technologies have the potential to create personalized, interactive, and student-centered learning environments that were enhanced engagement, critical thinking skills, knowledge retention, or other learning outcomes. However, although these tools may have great potential, many instructors face practical implementation challenges in embedding them into curricula because of factors such as limited training, resource constraints, and disparities in digital access (Kuriakose & Langedijk, 2023).

Technological advancement has thus brought a lot of changes in human life including in education. In Pakistan, and specifically in the NUML university, the implementation of this technique is affect greatly the preparation of students for such multifaceted labor market interaction as a digitalized and globalized one. There are few studies that assess the advantages and disadvantages from the teacher and student perspective. In addition, the study's authors argue that by giving policy advice and implementing it, a significant educational weakness such as in teaching-digital equity skills can be ameliorated in Pakistan and similar countries (Johnson & Ferrar, 2023). Indeed, it is this lack of information that necessitates the need for this study. Similarly, the central objective of this study is to gain a clear and in-depth understanding on what motivates undertaking such a research and also examine how recent usage of technology in educational facilities particularly institutions has influenced teachers' productivity.

The major purpose of this study is to clarify and examine the relationship between the recent increase in using technology in educational environments especially institutions and instructors' teaching efficacy. This research examines the impact of these tools on learning outcomes and the obstacles to their successful adoption to provide a framework for institutions to harness the full potential of emerging technologies, thereby empowering educators to create more effective, accessible, and future-ready learning environments.

Research Objectives

The specific goals of the research were to

1. Survey among NUML university students emerging technology's effects on their engagement and critical thinking abilities, and knowledge retaining.
2. Investigate innovative means for effective incorporation of technology in lessons to enhance personalized and student-centered learning environment at NUML university
3. Explore the opinion of the NUML university teachers about the adoption and effectiveness of the new educational technologies.

Research Questions

The study's research questions were

1. How do the emerging technologies affect NUML university students' engagement, thinking skills, and knowledge acquisition?
2. What are the methods of NUML university teachers to engage innovative technologies into classrooms to facilitate the development of personalized and student-centered learning environment?
3. What is the perspective of NUML university teachers on the adoption and effect of emerging educational technology?

Methodology

Research Design:

The study is essentially designed to be both a qualitative and a quantitative one, since it wants to explore how the educational practices are transformed through the use of new technologies. The quantitative component of the study used a survey design in which numerical data was collected from a large number of participants. A self-designed questionnaire was given to 70 students in which questions were asked concerning the perception of the integration of technology and the consequences it creates in terms of educational outcomes. Using a standardized questionnaire is also part of best practice in quantitative research as it facilitates standardized data gathering, which then can be analyzed statistically (Creswell & Creswell, 2022).The semi-structured interviews were conducted with 15 university teachers of different departments.

Population and Sample:

The population of the research includes all males and females- teachers and students-at the NUML University. A proper random sampling technique had been used wherein the sample becomes a representation from the larger study population of both teachers and the students at the NUML. In doing so, the possibility of selection bias in drawing broad conclusions is reduced (Fink, 2023). The sample size for this survey was 70 students and 15 teachers. They work with a randomly selected sample to make sure they're represented while also limiting the time bias that comes with collecting a huge number of nativity addresses.

Data Collection

Data collection was done by using a questionnaire that developed myself to measure these dimensions:

- The increase in technology in the learner's involvement, critical thinking, and memory skills.
- Effective integration strategies of technology with curriculum design.
- Perception of university teachers about emerging technologies.

The list includes closed-ended questions using a 5-point Likert scale that measures respondents' perceptions and experiences about the use of innovative technology in the education sector.

Data Analysis:

- **Descriptive Statistics:** The collected data is summed up by frequency and percentage distributions, mean scores, and standard deviations after the responses of participants.
- **Inferential Statistics:** The equal numbers of responses of teachers and students are compared with the use of the independent samples t-tests. On the other hand, regression analysis is another tool used to uncover the relationship between the integration of new technologies and the identified educational outcomes.

The data collected was analyzed using SPSS version 21, which was done by resorting to frequency analysis, percentage calculations, mean scores, standard deviation, t-tests for independent samples, and regression analysis. These are typical in quantitative research and offer the most powerful tools for the description of relationships between variables (Field, 2021).

Qualitative Study:

This study, in addition to the quantitative data, is collecting qualitative information by conducting semi-structured interviews amongst 15 university lecturers so as to better comprehend the obstacles educators face when incorporating new educational technologies and their thoughts on successful integration strategies. So, this research involves the qualitative part that means semi-structured interviews with educators after appropriate randomization have been carried out. This method allowed to deeply look into the teachers' experiences and perceptions of the integration of new technologies in their teaching. Discussion leads to the completion of semi-structured interviews in a more flexible way, where the issues of greatest concern are the focus of investigation (Kvale & Brinkmann, 2023). The participants are chosen on a substantial level of experience in integration, which can take on technology use in their teaching. By purposeful sampling, a diversity of perspectives within the sample could be included; thus, it plays an important role in qualitative research in order to acquire rich information and detailed responses from knowledgeable respondents (Palinkas et al., 2015). The qualitative data collected from interviews were analyzed thematically, allowing for the identification of key themes and patterns related to the integration of technology in education. Thematic analysis is a widely used method in qualitative research, providing a systematic approach to interpreting complex data (Braun & Clarke, 2021). This is important because, with the integration of data from different sources, it gives a broader understanding of how emerging technologies impact teaching and learning processes (Denzin, 2023). Triangulation is part of mixed-methods research and helps in verifying findings as well as providing a fuller picture of the research problem (Johnson & Onwuegbuzie, 2004).

Ethical Considerations:

Ethical clearance is taken from the head of departments, assuring that all people are involved give informed consent and their privacy be protected in all procedures of the research.

Limitations of the study:

This study is limited to the students and teachers of NUML University Multan campus

Significance of the Study

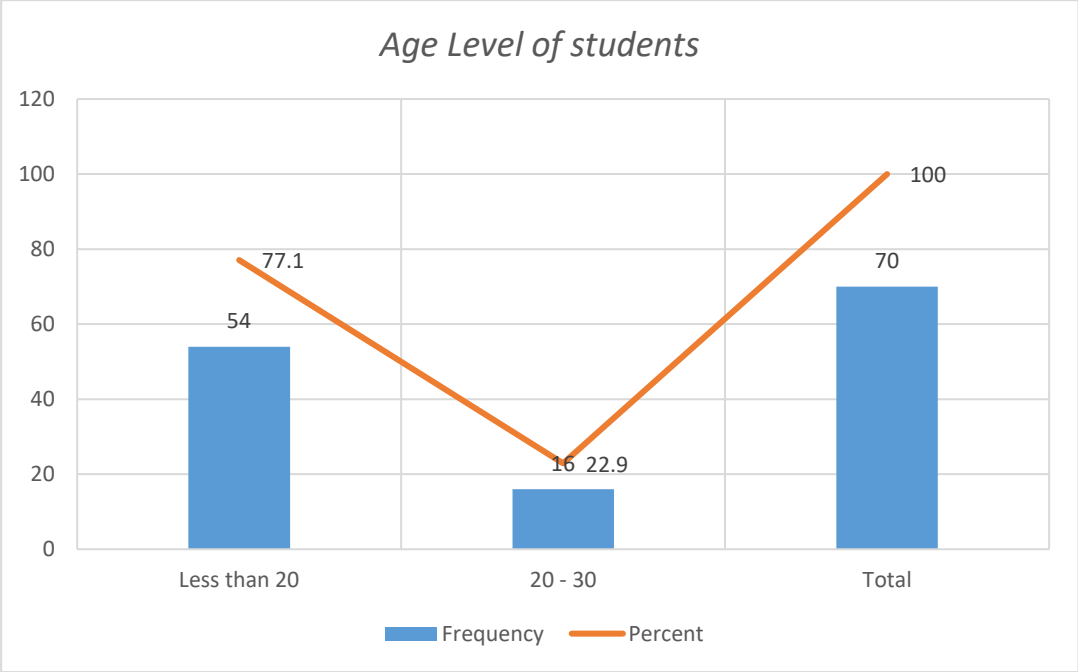
This research study is important because of how it will enhance the fields of educational technology and pedagogy, with higher education in Pakistan being one notable example. Embracing new technologies like artificial intelligence (AI), virtual reality (VR), and adaptive learning systems is a big leap towards improving the experiences of teaching and learning, particularly in the case of education. This study matters for several reasons.

1. This research will aid educators in identifying evidence that would support their best instructional strategies, as it will establish the impact of new technologies on learner engagement, critical thinking, and knowledge retention. Additionally. The students will experience better educational outcomes by being equipped with the competencies necessary for success in the digital era.
2. Leverage the insights from this research to enhance the existing literature on the integration of educational technology in South Asia. A thorough look at the pros and cons of these technologies is needed to fill in the gaps and guide further research.
3. The insights gained from this research can guide educational policy and practices at both the institutional and governmental levels. By finding out what the best skills and practices are to integrate digital technologies into the higher education sector, the study would be able to enlighten the political leaders on the effect of teacher training, infrastructure, and resources to make technology produce its intended benefits.
4. The aim of this research is to support teachers in their teaching process by training and equipping them with the knowledge and tools provided for them to include the latest technologies into their teaching practices. The use of these technologies by educators will enhance the teaching environment and result in a more comfortable and productive learning environment for students.

Results:

Table 1 Frequency Distribution at the Basis of Age Level of students

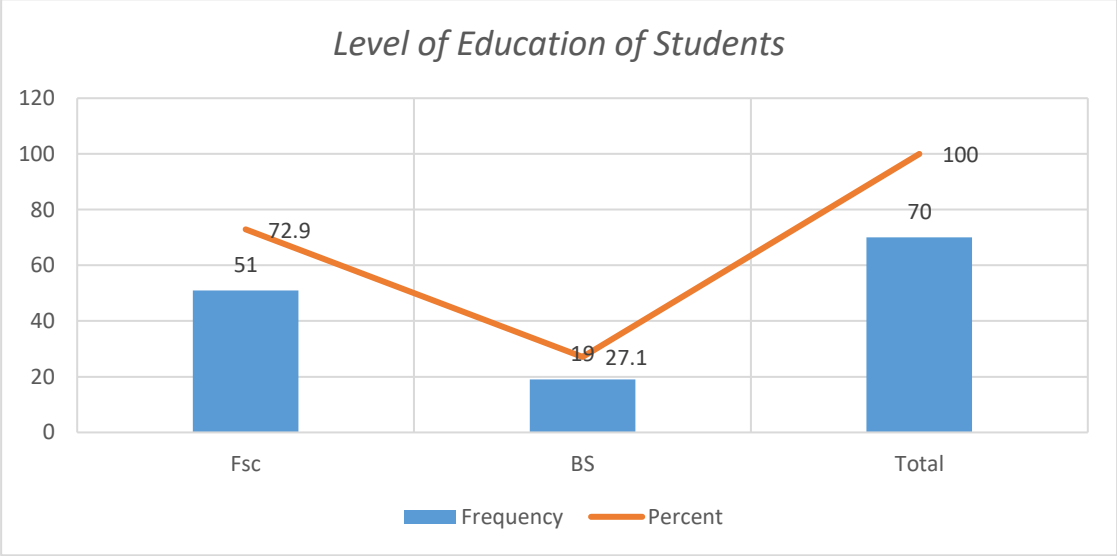
Age Level	Frequency	Percent
Less than 20	54	77.1
20 – 30	16	22.9
Total	70	100.0



The diagram described the frequency distribution at the basis of age level of students. The students less than 20 years of age (77.1%) were more than the students between the age of 20 to 30 years (22.9%).

Table 2 Frequency Distribution at the Basis of Level of Education of Students

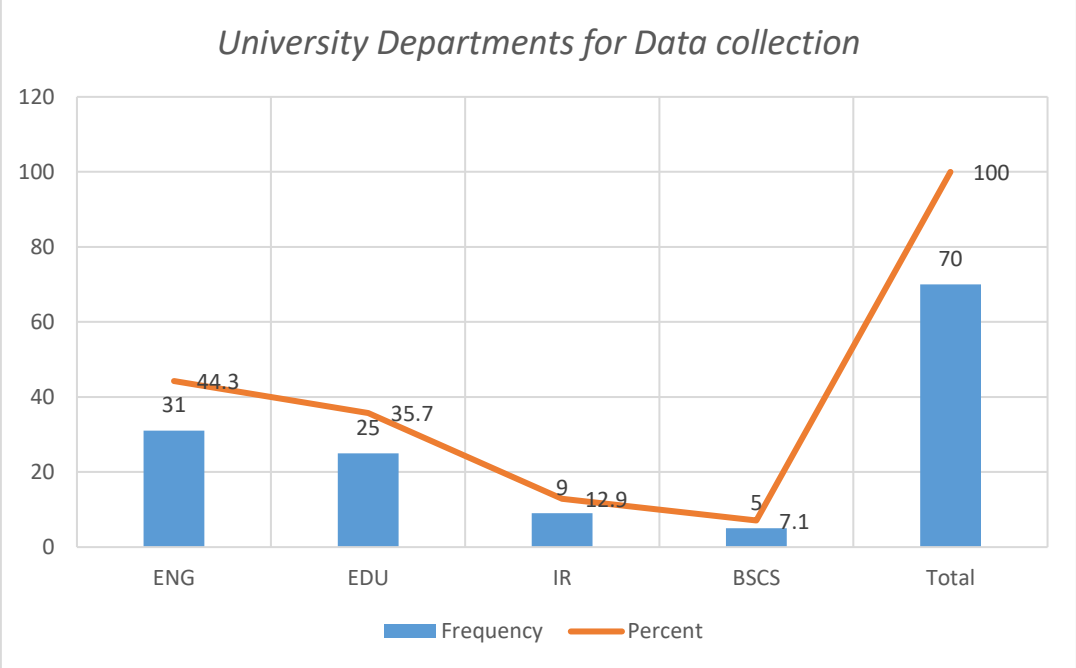
Level of Education	Frequency	Percent
Fsc	51	72.9
BS	19	27.1
Total	70	100.0



The diagram described the Frequency Distribution at the Basis of Level of Education of Students. The students with qualification of intermediate (72.9%) were more than the students with bachelor degree (27.1%).

Table 3 Frequency Distribution at the Basis of University Departments for Data collection

University Departments	Frequency	Percent
ENG	31	44.3
EDU	25	35.7
IR	9	12.9
BSCS	5	7.1
Total	70	100.0



The table described the Frequency Distribution at the Basis of University Departments for Data collection. The students of English department (44.3%) were more than the students from education department (35.7%), international relations department (12.9%) and the computer science department (7.1%).

Table 4 Section B: Impact of Technology on Learning Engagement and Critical Thinking

Sr.	Statement	F(%)	Mean	SD
1	The inclusion of technology tools has made it easier for me to keep my engagement the classes.	63(90)	4.5	0.6
2	VR has been an extremely helpful tool in grasping the complex concepts of the subject.	62(89)	4.4	0.5
3	The use of iPad, webcam, and projector which fill my lesson time for debates provides an overall enriched learning experience.	65(93)	4.6	0.4
4	Psychologically, I am to be more talkative especially on topics that involve technology's role	61(87)	4.4	0.5

	in life and relationships upon the inclusion of technology in the lessons.			
5	In my experience, the interactive learning applications work best as I am applying the gained knowledge to real-world scenarios, and I can improve my reasoning skills through induction.	58(83)	4.2	0.7
6	The inclusion of such devices as projectors in the process of interacting with the learning activities makes it better for the students to understand the subjects.	62(89)	4.5	0.6
7	The Metaverse is seen as a platform that encourages the creation of a community that is supported by AI and provides people with opportunities for engagement with digital technology.	60(86)	4.3	0.6
8	Electronic entertainment is more successful in capturing my brain for longer periods.	61(87)	4.4	0.5
9	The new technology along with VR games makes the classroom fun for me.	64(91)	4.6	0.4
10	I unlike most of my peers am a critical thinker and the difficulty of my questions proves it.	59(84)	4.3	0.6

Table described the frequency, mean and standard deviation of responses collected for impact of technology on learning engagement and critical thinking.

Table 5 Impact of Emerging Technologies on Learner Engagement, Critical Thinking, and Knowledge Retention

Response	Frequency	Percent
Disagree	20	28.6
Neutral	6	8.6
Agree	40	57.1
Strongly Disagree	4	5.7
Total	70	100.0

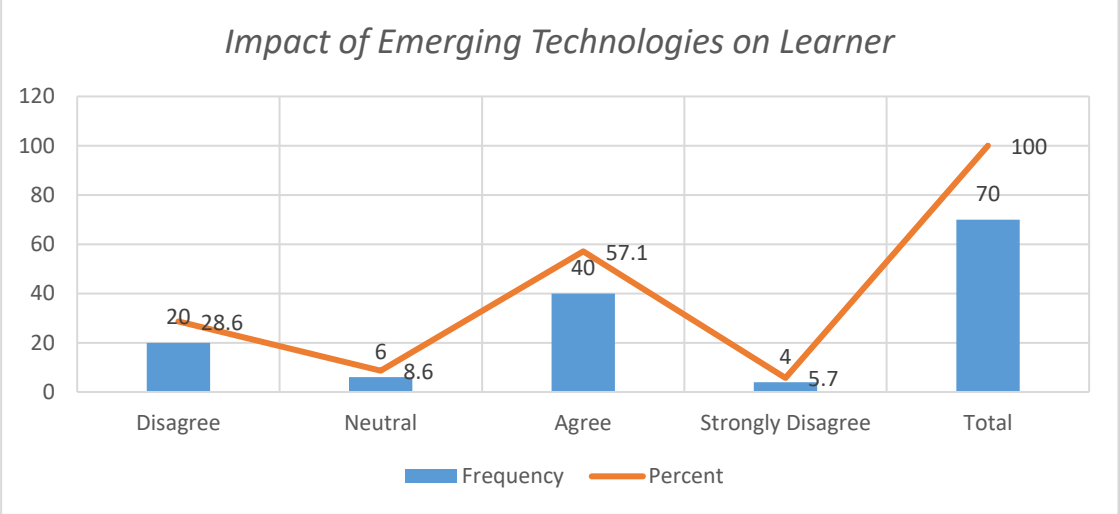


Table described the Frequency Distribution at the Basis of responses collected Impact of Emerging Technologies on Learner Engagement, Critical Thinking, and Knowledge Retention. Majority of respondents agreed (57.1%) with the statement that emerging technologies have positive impact on Learner Engagement, Critical Thinking, and Knowledge Retention.

Table 6 Section C: Effective Strategies for Integrating Technology into Curriculum Design

Sr.	Statement	F (%)	Mean	SD
1	My instructors do a great job of weaving new technologies into our lessons.	63(90)	4.5	0.5
2	Learning through projects that incorporate technology really helps me understand concepts more effectively.	61(87)	4.4	0.6
3	The curriculum offers a range of technological tools designed to cater to various learning styles.	59(84)	4.3	0.5
4	The collaborative tools we use in class really make my learning experience better.	63(90)	4.5	0.5
5	Technology offers personalized learning pathways that truly support my academic growth.	65(93)	4.6	0.4
6	Bringing technology into the mix fosters teamwork and collaboration among groups.	62(89)	4.5	0.5
7	I think technology should play a key role in how we design our curriculum.	66(94)	4.7	0.3
8	Teachers offer helpful advice on using technology in my learning journey.	60(86)	4.3	0.5
9	The curriculum is frequently refreshed to incorporate the newest technological developments.	58(83)	4.2	0.6
10	The different technologies included in my education have truly enhanced my learning experience.	63(90)	4.5	0.5

Based on the information found, the larger part of students (83% to 94%)) has come to the idea that it is quite beneficial for them to use modern technologies in the teaching process and be effective in the course. The mean scores are consistently high, indicating positive perceptions of technology in education among the surveyed students.

There were no significant differences between male and female students' opinions regarding the inclusion of new technologies in learning. T-test value is 0.01 df 88 and standard error of difference is 0.127. Both groups felt the same in their perceptions on whether technology made a difference to their learning.

Discussion of Results

This research study unfolds major insights on how emerging technologies such as AI, VR, and adaptive learning systems can be integrated into higher education, specifically at the National University of Modern Languages NUML, Multan. In this section, the author explains the

interpretation of the results based on research questions and objectives with regard to the implications they bear for pedagogy, curriculum design, and educational policy.

Quantitative Data Analysis and Discussion

The statement "The use of AI in my learning environment has increased my participation in class activities" scored mean, 4.5 (SD = 0.6) . Hence, most students concurred that AI has made them more captivating.' Earlier studies have shown that AI tools can promote positive interactions and motivation in the classroom, as Sun and Chen previously stated. Additionally, item B4 with a high mean score of 4.4 (SD = 0.5) was found to increase students' participation in discussions by incorporating technology. To this end, while item B5 was given a mean score of 4.2(SD = 0.7), something which indicates positive yet relatively varied student response towards the role of adaptive technologies in encouraging critical thinking, it is something that supports the contention of Chen et al. (2023) to the effect that adaptive learning tools facilitate reflective and higher-order thinking. Regarding knowledge retention, item B8 stating "I am more likely to retain information learned through interactive technologies compared to traditional methods" had a mean score of 4.4 (SD = 0.5). Students' high grades suggest that they might be willing to invest in the acquisition of further knowledge that lasts long, and this, in principle, is in line with the latest findings on immersive teaching (Brown & Taylor, 2022).

The item mean of Section C is a measure of how pupils view the use of technology in curriculum design. Students' scores on item C1 (“My instructors effectively integrate emerging technologies into the curriculum”) were 4.5 (SD = 0.5), indicating that their instructors are capable of using technology to enhance the content of the course. Garcia and Hwang (2023) contend that effective curriculum integration is crucial for maximizing technology's potential in learning environments, as supported by this finding. The positive perception of collaborative learning tools among students was evident in item C4, which received an average score of 4.5 (SD = 0.5). This item highlights the importance of collaboration and educational tools. The results of this were in agreement with the research conducted by Sanchez and Rivera, 2023, that highlighted the benefits of technology-based collaborative learning. The scores demonstrate that students have largely accepted and supported the integration of technology into their educational experiences, emphasizing the importance of effective technology integration strategies within curriculum frameworks.

Qualitative Analysis and Discussion of Findings

Interviews with educators were done using thematic analysis, which produced insightful perspectives about the integration of emerging technologies into teaching. Results were discussed against recent literature. For a thematic analysis of the semi-structured interviews conducted with 15 university teachers in respect of their experiences about implementing emerging technologies, we can take a systematic approach that was include coding the responses, then obtaining themes, and summarizing the findings

Positive Experiences with Technology Integration

Educators reported their experiences with emergent technologies-including AI and VR-as thoroughly positive. This is due to the fact that these technologies enhance experience, for more active and personalized environments. This factor is in agreement with Gao et al.'s (2023) study and Smith & Jones's 2022 view, which has shown that more immersive and flexible technologies enhance interest among students as well as deepen learning.

Popular Tools and Implementation Methods

Teachers pinpointed various instruments that could be introduced in the right way, which include AI platforms Quizizz & Kahoot SPSS NVivo ChatGPT , Connected Papers,Scite.ai, Litmaps, Research Rabbit,Grammarly, Nearpod,Quillbot, to allow for both individual feedback and practical learning. These instruments act as proof that the scientists had been correct by finding out that the tools helped students to acquire knowledge and achieve their desired performance goals by allowing them to practice tailored feedback and experiential learning experiences (Chen et al., 2023). Implementation often followed a stepped approach, where teachers introduced technology gradually in order to build familiarity and maximize engagement.

Enhanced Student Engagement and Critical Thinking

Many teachers reported that technology in the classroom dramatically increases engagement and critical thinking abilities because students are more likely to engage in AI-driven activities and VR simulations. The most recent study results verify this by demonstrating that AI and VR technologies are means for students to learn how to solve problems using critical thinking in a practical way, thus raising their problem-solving skills (Brown & Taylor, 2022; Peterson, 2024).

Effective Strategies for Technology Integration

Teachers described step-by-step, strategic integration as the most effective approach, providing time for both students and faculty to adapt to and maximize the technology's effect. This approach parallels Lee and Kim's (2023) suggestion for phased adoption, which serves as a firm basis for proper curriculum integration without losing the facilitative learning atmosphere.

Proactive Measures in Technology Utilization

Teachers supported moving forward to improve personal abilities and assisted coworkers in developing their competencies. The autonomous approaches are in consonance with the perspectives made available by Sanchez and Rivera (2023), who highlight that enhancing teachers' digital competencies independently enhances their resilience and makes them more suitable to overcome challenges in the process of teaching.

Future Role of Emerging Technologies

They indicated optimism toward the upcoming technology and its upcoming use in universities, given the fact that AI and VR are the technologies which will introduce the new adaptive and customized learning experience to learners. With AI observing learners' growth in order to individualize their paths, through recent studies (Garcia & Hwang, 2023; Williams, 2024). With respect to learner-centric learning, instructors view the aforementioned tools as central.

Technology Integration at the Institutional Level

NUML University is at the forefront of embracing modern educational advancements, continuously updating its programs to meet the evolving demands of the 21st century. With the successful introduction of cutting-edge programs like BS in Artificial Intelligence, the university demonstrates its commitment to integrating the latest technologies into education.

Additionally, NUML actively supports faculty development through regular training and workshops, ensuring that educators are equipped with the latest skills and pedagogical strategies. This forward-thinking approach not only enhances the teaching and learning experience but also positions NUML as a leading institution in innovation and academic excellence. Reflecting the ongoing trends in digital transformation within higher education, the faculty at NUML University have expressed their backing for innovative teaching methods (Clark & Zhang, 2023; Nguyen et al, 2020). NUML University empowers teachers with the essential tools to focus on effective teaching strategies through its commitment to integrating technology.

Conclusion.

This study demonstrates the capability of emerging technologies to revolutionize learning processes at NUML Multan. This research offered insightful information about how teachers can efficiently address the challenges of the current educational setup. Insights that have the ability to redefine the policies of educational institutions and provide avenues for more inclusive, diverse, and open systems of higher education.

This study highlights that incorporating new technologies like AI tools, VR, and adaptive learning systems can enhance students' engagement, boost critical thinking, and improve knowledge retention. It's clear that the high mean scores in areas related to engagement suggest that students feel more involved and motivated in a technology-supported learning environment. Moreover, the performance on items related to critical thinking and knowledge recall supports the notion that these technologies are capable of facilitating greater understanding and cognitive engagement. The research highlights that students find well-designed integration methods, like project-based and collaborative learning, to be highly useful, highlighting the importance of strategically using technology in order to maximize learning impacts.

This research indicates that students at NUML University are active learners and improve their learning experience when digital tools are integrated into their instruction. Emphasizing how important it is to integrate technology into curriculum design demonstrates that by providing the appropriate resources, environment, and training, new technologies can significantly enhance the learning process.

Recommendations

Based on the results of this study, several suggestions can be made to enhance the integration of emerging technologies in higher education, particularly at the National University of Modern Languages (NUML) . These guidelines are intended to assist educators, administrators and policymakers in implementing effective technology and making it the most efficient means of enhancing student learning.

1. Professional Development Programs.

1. In order to facilitate proper utilization of new technologies, institutions must provide professional development programs that offer continuous training to university instructors
2. Workshops, webinars and hands-on training on implementing AI tools, VR and adaptive learning systems in teaching practices are all viable options.

3. Encourage a collaborative atmosphere among teachers through the provision of mentorship chances that allow experienced teachers to help their colleagues apply new technologies.
4. A learning community can encourage sharing of knowledge and creative pedagogy.

2. Curriculum Design and Development.

1. The teacher has to accept the utilization of new technology in their teaching plans.
2. To ensure that learning becomes a fun and enjoyable activity for learners at all learning levels, one must associate learning objectives with technological tools.
3. Encourage the use of technology-based projects and experiences to advance real-world applications and cognitive skills.
4. For maximizing the learning experience, one must incorporate experiential learning experiences like simulations and virtual field trips.

3. Foster a Culture of Innovation.

1. Innovative teaching methods that incorporate technology should be introduced by institution.'".
2. Collect feedback from educators and students on their experiences with technology on a regular basis.

4. Research and Continuous Improvement.

1. Future research should concentrate on the long-term effects of technology integration upon student learning outcomes.
2. Longitudinal studies are a useful tool to gauge the continued effectiveness of emerging technologies in education.
3. Researchers must investigate the experiences of educators and students in various educational settings to identify best practices and strategies that can be tailored to different environments.
4. To reap full benefits from the new technologies, NUML University should enhance its digital literacy programs on a regular basis.
5. Knowledge of advanced tools like AI and VR can enhance users' engagement, learning, and effectiveness when used effectively. i.e.
6. The continuous professional development of faculty in technology integration strategies is essential.

Implementing these recommendations will enable institutions to effectively integrate emerging technologies into higher education, thus enhancing student engagement, critical thinking, and overall learning outcomes. It will prepare students for success in a digital world while empowering educators to navigate the complexities of modern educational practices.

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