PERCEIVED EFFECTIVENESS ON THE UTILIZATION OF DIGITAL PEDAGOGIES IN HIGHER EDUCATION

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ABSTRACT

This study investigates the perceived effectiveness and utilization of digital pedagogies at North Eastern Mindanao State University (NEMSU) Tandag Campus through a mixed-methods approach using an explanatory sequential design. The primary purpose is to determine how digital tools impact educational outcomes while identifying barriers to integration. Quantitative data were collected via the Technology Acceptance Model (TAM) survey, targeting randomly selected faculty and students from diverse academic departments. This is complemented by qualitative insights gathered through in-depth interviews allowing for a deeper exploration of challenges faced in implementing digital technologies.

Results indicate that while digital pedagogies are perceived as effective in enhancing educational experiences, significant barriers such as technical challenges, access disparities, and inadequate professional development persist. Digital tools are essential in education, enhancing engagement, personalizing learning, and improving collaboration. However, challenges like access disparities and inadequate training must be addressed for effective integration. Hence, NEMSU shall implement quarterly workshops for educators focusing on digital tools, enhance technical infrastructure, and ensure equitable access to resources. Targeted professional development must prioritize interactive learning and address challenges to maximize the effectiveness of digital pedagogies for all students.

Keywords *Digital pedagogies, explanatory sequential, technology acceptance model, educational outcomes, Professional development*

1. INTRODUCTION

Higher education institutions are increasingly adopting digital tools to support teaching and learning in today's fast-changing world. These digital approaches, called digital pedagogies, offer new ways to engage students, make learning more interactive, and improve educational outcomes (Al Lily et al., 2020). As educators adapt to these technologies, understanding their effectiveness has become crucial for shaping the future of teaching and learning in higher education.

Numerous studies have examined the impact of digital tools on student learning, including the role of data analytics in enhancing teaching strategies (Siemens & Gasevic, 2022) and distinctions between online learning and emergency remote teaching during the COVID-19 pandemic (Hodges et al., 2021). However, much of this research focus on either the student perspective or specific contexts, leaving gaps in understanding the broader impact of digital tools, particularly in higher education. Addressing these gaps, this study focuses on Northeastern Mindanao State University (NEMSU), where limited digital infrastructure and relevant policies present unique challenges to implementing digital pedagogies. By investigating both student and educator perspectives at NEMSU, this research sought to provide a balanced view of the effectiveness of digital tools, highlighting both the benefits and barriers to successful integration. Understanding these challenges is essential to developing tailored solutions that meet local needs and ensure that technology serves to enhance rather than hinder the learning experience.

This study addresses significant gaps in the literature on digital pedagogies in higher education. First, it focuses on specific disciplines, such as teacher education, midwifery, and computer science where digital tools are crucial for effective training, thus filling a void in research that often overlooks these areas. Additionally, it explores the

perceived effectiveness of digital pedagogies, which is frequently underreported. The study also identifies challenges educators face when implementing these technologies, providing a nuanced understanding of barriers that hinder effective use. By employing a mixed-methods approach, this research aimed to offer comprehensive insights into how digital pedagogies can be better integrated into higher education.

Hence, the significance of this research lies in its potential to inform educational practices, not just at NEMSU but also at other institutions facing similar challenges. This study aimed to highlight how digital tools can improve student engagement, boost academic performance, and facilitate learning across different subjects by gathering insights from both teachers and students. Furthermore, the findings help shape policies, curriculum development, and teacher training programs, making digital education more inclusive and effective for diverse student populations. Thus, this study contributes to the ongoing investigation of digital innovation in education. The results of this research can guide educators and institutions in adopting more effective and contextually appropriate digital teaching strategies, ultimately enhancing the overall educational experience for students.

1.1 CONCEPTUAL FRAMEWORK

The conceptual framework of this study explored the use of digital pedagogies in higher education specifically the North Eastern Mindanao State University-Tandag Campus, focused on two main areas: areas of focus, and intervention strategies to enhance the digital pedagogies of both teachers and students.

The core areas of focus in the framework included the extent of digital tool usage, perceived effectiveness, and challenges related to implementation. These elements highlighted the impact of digital pedagogy adoption in classrooms on learning outcomes, student engagement, and instructional practices. This section is vital for evaluating whether digital tools truly enhance learning and identifying specific barriers educators and students may encounter, such as a lack of resources or technical support.

Finally, the intervention component of the study aimed to develop an action plan based on the findings from the focus areas. This plan proposed strategies to enhance digital pedagogy implementation, including targeted training for educators, and improved support systems. The proposed plan offers a comprehensive approach to optimizing digital pedagogies in higher education. The goal is to create a dynamic, interactive learning environment that caters to the diverse needs of student that enhances the utilization of digital pedagogies in higher education institution like North Eastern Mindanao State University.
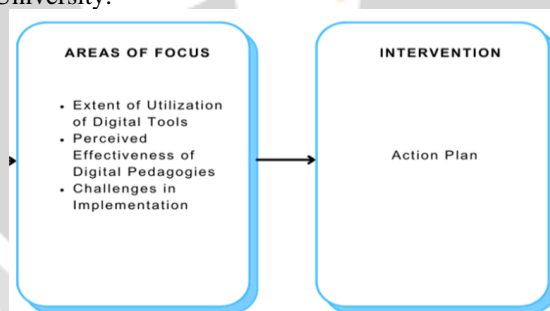
1.2 STATEMENT OF THE PROBLEM

The study investigated the perceived effectiveness of digital pedagogies in higher education institutions, particularly the North Eastern Mindanao State University-Tandag Campus. Specifically, it sought to answer the following:
1. What is the extent of utilization of digital tools in the classroom?
2. What is the effectiveness of the Digital Pedagogies as perceived by the two groups of respondents?
3. Is there a significant relationship between the extent of utilization and the perceived effectiveness of the Digital Pedagogies as perceived by the two groups of respondents?
4. What are the key challenges encountered by educators and students in the implementation and use of digital technology in the classroom?

Hypothesis
H_{01}: There is no significant relationship between the extent of utilization of the perceived effectiveness of the Digital Pedagogies as perceived by the two groups of respondents.

Scope and Limitations of the study
This research investigated the effectiveness of digital pedagogies in higher education specifically North Eastern Mindanao State University-Tandag Campus focused on the experiences of educators and students during the Academic Year 2023-2024. The study explored essential factors, including how often digital tools are used in classrooms and the challenges educators and students encounter when implementing these technologies. The study specifically includes respondents from the College of Teacher Education, College of Midwifery, and College of Computer Studies and Technology because these programs deeply integrate digital pedagogy into their curricula. While other programs utilize digital tools, they do so less extensively. This targeted focus allows for a more thorough exploration of unique challenges and effective practices related to digital pedagogy, ultimately enhancing the validity and relevance of the findings in these critical educational contexts. While the study offers valuable insights into digital pedagogies, its limitations include a singular focus on one academic institution, which may restrict the generalizability of the findings to other contexts. Additionally, the reliance on self-reported data introduces potential bias, as participants' perceptions may not fully capture the objective effectiveness of the digital tools utilized. Although there are constraints, this research enhances the understanding of challenges associated with digital pedagogies in higher education and provides practical recommendations for improvement.

Research Design
This study employed a mixed-methods approach utilizing an explanatory sequential design to assess the perceived effectiveness and utilization of digital pedagogies in higher education. Initially, quantitative data will be collected and analyzed through a descriptive correlational method to determine the extent of digital tool utilization in teaching and learning processes, as well as the perceived effectiveness of these digital pedagogies among two groups of respondents. Following the quantitative phase, qualitative data will be gathered through in-depth interviews with participants to explore the challenges faced by educators and students in implementing and using digital technologies in the classroom. This qualitative component aims to provide richer, contextual insights into the obstacles encountered, complementing the quantitative findings. By integrating quantitative and qualitative data, this mixed-methods approach will comprehensively understand how digital pedagogies are perceived, utilized, and challenged within higher education. The explanatory sequential design is particularly valuable for clarifying unexpected results from the quantitative analysis, as it allows for narrative data to enhance the interpretation of numerical findings. Ultimately, this methodology seeks to capture the complexities of digital tool integration and provide actionable insights to improve digital pedagogy practices.

2. Extent of Utilization of Digital Tools in the Conduct of the Teaching and Learning Process

The table 2 reflected the extent of the Utilization of Digital Tools in the conduct of the teaching and learning process. The indicators for the frequency of use of digital tools in teaching and learning activities show an average weighted mean of 3.96, indicating that digital tools are often utilized. This frequent use demonstrates a significant shift in educational practices towards integrating technology, likely accelerated by the COVID-19 pandemic, which forced educators to adapt to remote teaching environments. Studies by Trust and Whalen (2021) highlight how the pandemic has necessitated an increase in the adoption of digital tools in education.

Digital tools' integration into the curriculum is described with an average weighted mean of 4.18, suggesting they are often utilized as an essential part of daily educational routines. The high scores for using Learning Management Systems (LMS) and enhancing interactivity with digital tools underscore the shift towards a more digital-centric curriculum. According to Crompton et al. (2020), the integration of digital tools significantly enhances student engagement and learning outcomes by providing interactive and personalized learning experiences.

The average weighted mean of 4.20 for the type of digital tools used indicates they are always utilized. The high utilization of video conferencing tools (4.44) and online collaboration tools (4.37) reflects the importance of these technologies in facilitating remote learning and collaboration. As noted by Khalil et al. (2020), the use of video conferencing and collaboration tools became crucial for maintaining educational continuity during the pandemic when face to face was limited.

With an average weighted mean of 4.37, the purpose of using digital tools is highly focused on enhancing student engagement, personalized learning, timely feedback, collaboration, and tracking progress. This suggests a strategic use of technology to improve educational outcomes. Studies by Bond et al. (2021) indicate that digital tools are effective in providing tailored learning experiences and fostering a collaborative learning environment.

The average weighted mean of 4.33 in the ease of use category indicates that educators find digital tools easy to use and receive adequate support and training. This confidence in using digital tools is critical for successful technology

integration in education. Research by Howard et al. (2022) highlights that professional development and training are key to empowering educators to effectively use digital tools.

The results indicate a high level of integration and utilization of digital tools in education, with significant implications. The frequent use of digital tools can lead to more engaging, interactive, and personalized learning experiences for students. Further, the results underscore that increased access and flexibility to digital tools provide flexibility in learning, allowing for both synchronous and asynchronous educational activities, which can cater to diverse learning needs and schedules. The use of digital assessment tools enables timely and effective feedback, aiding in continuous student performance monitoring and improvement.

Indicators	Weighted Mean	Verbal Description
Frequency of Use		
I regularly use digital tools in my teaching/learning activities.	3.92	Often Utilized
I use digital tools to prepare and organize lessons/assignments.	3.78	Often Utilized
I incorporate multimedia resources (videos, animations, etc.) in my teaching/learning process.	3.87	Often Utilized
I use digital assessment tools (e.g., online quizzes, e-portfolios) to evaluate performance.	4.02	Often Utilized
I engage in online discussions or forums related to my course.	4.21	Always Utilized
Average Weighted Mean	**3.96**	**Often Utilized**
Integration into Curriculum		
Digital tools are an essential part of my daily educational routine.	4.31	Always Utilized
I make use of Learning Management Systems (e.g., Moodle, Blackboard) to manage my coursework.	4.33	Always Utilized
I use digital tools to enhance the interactive nature of the class.	4.27	Always Utilized
Digital tools are integrated into the lesson presentation to better achieve course objectives.	3.98	Often Utilized
Digital tools are used in the class to facilitate both synchronous and asynchronous learning.	4.03	Often Utilized
Average Weighted Mean	**4.18**	**Often Utilized**
Type of Digital Tools Used		
I utilize online collaboration tools (e.g., Google Docs, and Microsoft Teams) for group projects.	4.37	Always Utilized
I use video conferencing tools (e.g., Zoom, Microsoft Teams) for virtual classes or meetings.	4.44	Always Utilized
I use educational apps (e.g., Kahoot, Quizlet) to enhance my learning/teaching experience.	3.93	Often Utilized
I access and utilize digital libraries and academic databases for research.	4.11	Often Utilized
I use interactive whiteboards or smartboards in my teaching/learning process.	4.17	Often Utilized
Average Weighted Mean	**4.20**	**Always Utilized**
Purpose of Use		
Digital tools are used to enhance student engagement in the classroom.	4.33	Always Utilized
Digital tools are used for personalized learning experiences tailored to individual student needs.	4.57	Always Utilized
Digital tools are used to provide timely feedback to students.	4.22	Always Utilized
Digital tools are used to facilitate collaboration among students.	4.43	Always Utilized
Digital tools are used to track and assess student progress over time.	4.28	Always Utilized
Average Weighted Mean	**4.37**	**Always Utilized**
Ease of Use		
1. I find digital tools easy to use for teaching/learning activities.	4.27	Always Utilized
2. I receive adequate support and training to effectively use digital tools.	4.31	Always Utilized
3. I can quickly troubleshoot any issues that arise with digital tools.	4.29	Always Utilized
4. I have access to user-friendly digital tools for my educational needs.	4.37	Always Utilized
5. I am confident in my ability to effectively use digital tools in my teaching/learning activities.	4.41	Always Utilized
Average Weighted Mean	**4.33**	**Always Utilized**
Overall Weighted Mean	**4.21**	**Always Utilized**

2.1. Perceived Effectiveness of the Digital Pedagogies as Perceived by the Two Groups of Respondents

The data provided in the table reflects a comprehensive evaluation of the use and integration of digital tools in educational settings, with detailed insights across five key categories: frequency of use, integration into the curriculum, types of digital tools used, purpose of use, and ease of use.

Indicators	Weighted Mean	Verbal Description
Learning Outcomes		
1. Digital pedagogies enhance my understanding of the course material.	4.33	Very effective
2.Digital tools improve my academic performance.	4.51	Very effective
3. Using digital tools helps students achieve better grades.	4.38	Very effective
4. Academic information are retained better when digital tools are used.	4.42	Very effective
5. Digital pedagogies support learning goals.	4.29	Very effective
Average Weighted Mean	**4.39**	**Very effective**
Student Engagement		
1.I feel more engaged when using digital tools in the classroom.	3.85	Effective
2.Digital tools make learning more interesting.	3.91	Effective
3. Digital tools help students be more focused during lessons.	4.31	Very effective
4.Students are more motivated to learn when digital tools are incorporated into the lessons.	3.77	Effective
5.Students participate more in class activities when digital tools are used.	3.79	Effective
Average Weighted Mean	**3.92**	Effective
Communication		
1.Digital tools facilitate better communication between students and teachers.	4.33	Very effective
2. Digital tools make it easier to ask questions and get answers.	4.71	Very effective
3. I find it easier to collaborate with peers using digital tools.	4.49	Very effective
4. Digital tools help facilitate communication more effectively between instructor and students.	4.36	Very effective
5. Digital tools improve the overall communication in the learning environment.	4.29	Very effective
Average Weighted Mean	**4.43**	**Very effective**
Interactivity		
1. Digital tools make the learning process more interactive.	4.36	Very effective
2. Interactive digital tools help in better understanding complex concepts.	4.29	Very effective
3. Both teachers and students enjoy using interactive digital tools for the teaching and learning activities.	4.19	Effective
4. Interactive digital tools increase the participation in the class.	4.22	Very effective
5. Interactive digital tools make the lessons more engaging.	4.07	Effective
Average Weighted Mean	**4.23**	**Very effective**
Skill Development		
1. Digital pedagogies help students develop critical thinking skills.	4.02	Effective
2. Using digital tools enhances the students problem-solving abilities.	4.17	Effective
3. Digital tools improve the students and teachers' ability to work collaboratively.	3.94	Effective
4. Digital pedagogies help in developing students and teachers' time management skills.	3.98	Effective
5. Using digital tools helps enhance the digital literacy skills of both teachers and students.	3.79	Effective
Average Weighted Mean	**3.98**	**Effective**
Overall Weighted Mean	4.19	**Effective**

The weighted means for the frequency of use of digital tools in teaching and learning activities are consistently high, averaging at 3.96, indicating these tools are often utilized. Specific activities such as using digital tools to prepare and organize lessons (3.78), incorporating multimedia resources (3.87), and using digital assessment tools (4.02) reflect a trend towards embracing digital methodologies to enhance educational processes. This trend is reinforced by the increased reliance on digital tools during the COVID-19 pandemic, which necessitated remote and hybrid learning environments. Trust and Whalen (2021) highlighted that this period catalyzed a significant shift in educators' use of digital tools, enhancing their familiarity and competence in leveraging technology for teaching.

Digital tools' integration into the curriculum demonstrates an even stronger adoption, with an average weighted mean of 4.18, signifying that these tools are often considered an essential part of daily educational routines. High scores in using Learning Management Systems (4.33) and enhancing class interactivity (4.27) underscore the pivotal

role digital tools play in modern education. Crompton et al. (2020) found that such integration leads to improved student engagement and learning outcomes by facilitating more interactive and personalized educational experiences. The utilization of various digital tools is robust, with an average weighted mean of 4.20, indicating they are always utilized. Tools like video conferencing (4.44) and online collaboration platforms (4.37) are particularly prominent, reflecting their importance in maintaining connectivity and collaboration in educational contexts. Khalil et al. (2020) noted that during the pandemic, these tools were crucial in ensuring the continuity of education, allowing students and educators to interact and collaborate effectively despite physical distancing measures.

The purpose of using digital tools is highly focused, with an average weighted mean of 4.37, pointing to their critical role in enhancing student engagement, providing personalized learning experiences, facilitating collaboration, and tracking student progress. The use of digital tools to enhance engagement (4.33) and personalize learning (4.57) reflects a strategic approach to leveraging technology for better educational outcomes. Bond et al. (2021) highlighted that digital tools are effective in creating dynamic, tailored learning environments that meet individual student needs and foster collaboration among students.

The ease of use of digital tools is well-rated, with an average weighted mean of 4.33, indicating educators find these tools user-friendly and well-supported. High scores in access to user-friendly tools (4.37) and confidence in using them (4.41) suggest that educators are well-equipped to integrate digital technologies into their teaching. Howard et al. (2022) emphasized the importance of professional development in ensuring educators are confident and competent in using digital tools, highlighting that adequate training and support are key to effective technology integration in education.

The implications of these results are multifaceted. Firstly, the frequent and effective use of digital tools suggests a significant shift towards more technology-enhanced learning environments, which can lead to improved student engagement and outcomes. Secondly, the integration of these tools into the curriculum highlights their essential role in modern education, facilitating interactive and personalized learning experiences. Thirdly, the reliance on diverse digital tools underscores the importance of having a variety of technological resources to support different aspects of teaching and learning. Finally, the high ease of use ratings indicate that ongoing support and professional development are crucial for educators to maximize the potential of digital tools in education.

2.2. Significant relationship between the extent of utilization and the perceived effectiveness of the digital pedagogies as perceived by the two groups of respondents

Source of Variances	r-value	p-value	Decision
Extent of utilization and the perceived effectiveness of the Digital Pedagogies as perceived by the two groups of respondents	0.0412	0.003	Accept Null Hypothesis

The ANOVA results indicate a significant difference between the two groups of respondents regarding the extent of utilization and the perceived effectiveness of digital pedagogies. The significant p-value (0.003) suggests that there is a notable difference in how the two groups of respondents perceived the extent of utilization and effectiveness of digital pedagogies. The significant difference indicates that educators and students perceived the utilization and effectiveness of digital pedagogies differently. This could be due to varying levels of exposure, experience, and comfort with digital tools. Trust and Whalen (2021) found that educators who had to rapidly adapt to digital tools during the pandemic had diverse experiences and perceptions based on their prior familiarity and the support they received.

The significant difference in the extent of utilization and perceived effectiveness of digital pedagogies between the two groups of respondents highlights the need for targeted professional development and careful evaluation of digital tools. By addressing these areas, educational institutions can better cater to the diverse needs and perceptions of their stakeholders, ultimately enhancing the effectiveness of digital pedagogies.

3. Thematic Analyses of the Key challenges encountered by educators and students in the implementation of digital technology in the classroom

The thematic analyses presented reveal a multifaceted landscape of challenges that educators and students encounter in the integration of digital technology within educational settings. The identified themes—Technical Challenges,

Access Challenges, Professional Development, and Engagement Challenges—interrelate to form a complex web of issues that hinder the effective use of technology in classrooms.

Technical Challenges

The theme of Technical Challenges encapsulates the myriads of technical difficulties that educators face, which can significantly disrupt teaching and learning processes. Common issues include unreliable internet connectivity, malfunctioning digital tools, and a lack of troubleshooting support.

The various technical difficulties faced by educators and students when utilizing digital tools. These issues can disrupt teaching and learning processes, indicating a need for improved infrastructure and support systems. As articulated by the key informants:

> K1: *"I frequently experience technical problems when using digital tools in the classroom."*
>
> K2: *"Internet connectivity issues disrupt my teaching/learning activities."*
>
> K4: *"I have difficulty troubleshooting technical problems on my own."*
>
> K8: *"The digital infrastructure at my institution is inadequate."*
>
> K20: *"Digital tools often malfunction or are unreliable."*

The responses of the key informants were consonant with the study of LeFebvre and Allen (2014) highlights that inadequate technical infrastructure can lead to frustration among educators, ultimately affecting their ability to deliver effective instruction. When teachers encounter technical issues during lessons, it not only disrupts the flow of teaching but can also diminish students' engagement and learning outcomes. Additionally, the absence of readily available technical support staff further exacerbates these challenges. The same idea of Alfelaij (2016) found that when teachers do not have immediate access to technical assistance, their confidence in using digital tools diminishes, leading to underutilization of these resources. This underscores the necessity for educational institutions to invest in robust technical support systems that empower educators to troubleshoot issues effectively.

Access Challenges

Access Challenges illuminate the disparities in access to digital resources among students, particularly those from varying socio-economic backgrounds. Many students lack essential digital devices or reliable internet access outside school hours, which creates significant barriers to equitable learning opportunities. The concept of the digital divide is well-documented in educational research. It was pronounced by the key informants that access is one of the barriers encountered as the

> K7: *"Not all students have access to the necessary digital devices."*
>
> K9: *"There is a lack of digital resources available for my subject area."*
>
> K14: *"There are insufficient licenses for educational software at my institution."*
>
> K17: *"There is a digital divide among students from different socio-economic backgrounds."*

This theme highlights the barriers related to access and availability of digital resources for both students and teachers. The indicators suggest that while these challenges are perceived as minor, they still reflect significant disparities that can hinder effective technology integration in educational settings. The study of Dhawan (2020) emphasizes that students from lower socio-economic backgrounds are disproportionately affected by these disparities, resulting in lower academic performance and engagement levels. This inequity not only hinders individual student success but also perpetuates broader societal inequalities. Addressing these access challenges requires a concerted effort from educational institutions to ensure equitable access to technology. This includes providing necessary devices, improving internet connectivity, and offering resources that cater to diverse learning needs. Initiatives such as community partnerships and funding for technology access can help bridge these gaps.

Professional Development

The theme of Professional Development underscores the critical need for comprehensive training programs designed to equip educators with the skills necessary for effective digital technology integration. Many teachers express a desire for ongoing professional development that encompasses various aspects of digital literacy and pedagogical strategies. As uttered by the key informants:

> K8: *"There is less Comprehensive Training Program that covers various aspects of digital technology integration in the classroom."*
>
> K16: *"Limited opportunities on ongoing professional development for teachers to enhance their digital literacy skills and pedagogical knowledge."*
>
> K19: *"There are minimal peer learning communities where teachers can share best practices and collaborate on integrating digital technology into their teaching."*
>
> K15: *"Less technical support staff are readily available to assist teachers with any issues related to technology integration during instructional hours."*

K3: "No feedback mechanisms for teachers to provide input on the effectiveness of training programs and support services."

These responses are congruent with the findings of Jones (2004) that without adequate training, teachers may feel overwhelmed by new technologies, leading to resistance to adopting them in their classrooms. Furthermore, establishing peer learning communities is essential for fostering collaboration among educators. Brantley-Dias and Ertmer (2013) argue that such communities can facilitate the sharing of best practices and experiences, ultimately enhancing teachers' confidence and competence in integrating technology into their teaching. Additionally, the lack of feedback mechanisms for educators regarding training effectiveness indicates a need for continuous improvement in professional development programs. By soliciting input from teachers on their training experiences, institutions can tailor programs to better meet their needs.

Engagement Challenges

Engagement Challenges focus on how digital technology integration impacts student engagement and learning outcomes. Many educators report insufficient opportunities for students to engage with technology through interactive and personalized learning experiences. As reiterated by the key informants:

K5: "Less opportunities for students to actively engage with digital technology through hands-on activities, simulations, and collaborative projects."

K 6: "Assessments are not aligned with learning objectives."

K10 : "Digital technology is seldom used to personalize instruction and meet the diverse needs of students, including those with learning disabilities."

K12: "Students' progress as well as areas for improvement are not addressed with regular feedback provided to students to support their learning journey."

K13: "The development of 21st-century skills such as critical thinking, collaboration, creativity, and digital literacy through the integration of technology into classroom activities is not observed."

The responses of the key informants on the impact of digital technology integration on student engagement and learning outcomes; although categorized as challenges, these issues highlight the need for more interactive, personalized learning experiences that foster critical skills essential for success in the modern world. This is also in parallel with the findings of Filipe et al. (2019) highlight that effective technology integration should facilitate personalized learning experiences tailored to individual student needs. When technology is used merely as a supplementary tool rather than an integral part of the learning process, it fails to engage students meaningfully. The lack of alignment between assessments and learning objectives further complicates this issue. Gane et al. (2018) found that when assessments do not reflect the skills being taught—such as critical thinking or collaboration—students may become disengaged and less motivated to participate actively in their learning. Moreover, the development of essential 21st-century skills is crucial in preparing students for future success; however, when digital technology is underutilized or misaligned with pedagogical goals, opportunities for cultivating these skills diminish. Educators must prioritize creating interactive environments that encourage critical thinking, creativity, and collaboration through technology.

Finally, addressing these challenges requires a multifaceted approach involving improvements in technical infrastructure, equitable access to resources, robust professional development for educators, and strategies that foster student engagement through personalized learning experiences. By drawing on existing literature and research findings, it becomes evident that systemic changes are necessary to create an educational landscape where technology enhances teaching and learning rather than obstructs it. Educational stakeholders must collaborate to develop solutions that not only address these challenges but also empower both educators and students to thrive in an increasingly digital world.

4. CONCLUSION

The findings of the study conclude that digital tools have become integral to modern educational practices, significantly enhancing student engagement and facilitating personalized learning experiences. The widespread use of Learning Management Systems and collaboration tools reflects a strong commitment among educators to leverage technology for effective teaching. Additionally, the ease of use and adequate support for these tools contribute to their successful integration, ultimately leading to improved educational outcomes and a more interactive learning environment.

Thus, digital pedagogies are generally perceived as effective in enhancing educational experiences, particularly in improving learning outcomes and facilitating communication between students and teachers. While these tools significantly boost understanding and collaboration, there remains an opportunity to further enhance student

engagement and skill development. Overall, the integration of digital tools into educational practices is essential for fostering a more interactive and engaging learning environment.

Consequently, there is a significant relationship between the extent of utilization and the perceived effectiveness of digital pedagogies, highlighting differing perceptions among respondents. This underscores the need for targeted professional development and inclusive policies to address the diverse needs of educators and students.

Hence, integrating digital technology into education faces several significant challenges, including technical issues, access disparities, inadequate professional development, and engagement deficits. Addressing these interconnected challenges is essential for effective technology integration.

Lastly, the digital empowerment initiative is developed to effectively address the challenges of integrating digital technology into education by improving technical infrastructure, ensuring equitable access to resources, enhancing professional development for educators, and fostering engaging learning experiences for students.

5. ACKNOWLEDGEMENT

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