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Application of Online Educational Tools in Obafemi Awolowo University, Ile-Ife: The Students' Perception

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Abstract

This study explored the application of online educational tools in Obafemi Awolowo University, Ile-Ife, with a focus on student perceptions. It identified the tools deployed, determined their areas of application, assessed their impact on learning outcomes, and analyzed the associated challenges. Relying on a survey conducted among selected 260 undergraduate students of the university, its findings revealed that Google Classroom and Google Meet were the most frequently used online tools, mainly for lectures, assignments, and information dissemination. Other tools like e-Zone, Microsoft Teams, Zoom, Moodle, and Blackboard were sparingly used. The findings showed that while online tools enhanced flexibility and accessibility thus enhancing academic performance, challenges such as technical issues and absence of motivation hinder their effective use. The study concluded that improving digital infrastructure and providing adequate training for both students and educators are essential for maximizing the benefits of online educational tools in higher education.

Keywords: University, Students, Online Educational Tools, ICT**,** Higher Education.

INTRODUCTION

Online educational tools have revolutionized the educational landscape, offering diverse functionalities that enhance teaching and learning experiences. These tools encompass communication platforms, interactive whiteboards, quiz makers, work planning tools, social media channels, document management systems, and video tools, all designed to facilitate virtual engagement and collaboration. The significance of these tools lies in their ability to provide flexible, accessible, and interactive learning environments that cater for various educational needs.

At Obafemi Awolowo University Ile-Ife, the adoption of online educational tools has been transformative, especially during the global shift towards remote learning necessitated by the COVID-19 pandemic. This paper explores the perceptions of students regarding the application of these tools within the University. The study aims to identify the specific tools used, ascertain their areas of application, assess their impact on students' learning outcomes, and analyze the challenges encountered in their application.

The integration of online educational tools into higher education institutions like Obafemi Awolowo University is crucial for promoting digital literacy, enhancing engagement, and ensuring continuous learning. By understanding students' perceptions and experiences, this research provides insights into the effectiveness of these tools and offers recommendations for optimizing their use in enhancing educational quality and accessibility.

LITERATURE REVIEW

An Overview of Online Educational Tools

Online educational tools play a vital role in modern education, offering a diverse range of software and platforms designed to enhance teaching and learning experiences in virtual environments. These tools encompass various features and functions aimed at reviewing student performance, identifying effective teaching strategies, and fostering an inclusive learning

environment (Allen & Seaman, 2017). An online educational tool is software that facilitates virtual engagement in classroom activities, providing features such as collaborative communication, digital resources, and immediate feedback (Allen & Seaman, 2017). These tools are designed to bridge the gap between traditional and digital learning environments, offering educators and students a wide array of functionalities to support teaching and learning processes. Online educational tools can be categorized into several forms based on their functionalities:

i. **Communication Tools:** Effective communication is essential for successful teaching and learning, whether in physical or virtual classrooms. Online communication tools facilitate interaction with larger groups through video conferencing and messaging platforms, enhancing the quality of the teaching-learning process.
ii. **Whiteboards:** Online whiteboards emulate the classroom experience by providing an infinite canvas for creating diagrams, charts, and visualizations. They offer tools for interactive learning, allowing students to engage actively in content creation and exploration.
iii. **Quiz Makers:** Online quiz makers simplify the creation, formatting, and sharing of assessments, enabling educators to track and score students' performance effectively. Platforms like Google Forms provide intuitive interfaces for generating quizzes and managing responses.
iv. **Work Planning Tools:** These tools help in maintaining work schedules for educators and students, optimizing time management in e-learning environments. Platforms like Google Calendar and Calendly offer scheduling features that enhance organization and productivity.
v. **Social Media Channels:** While primarily used for social interaction, social media platforms also serve as educational tools, fostering continuous communication and collaboration among teachers and students. They facilitate the sharing of resources, information, and discussions beyond classroom hours.
vi. **Document Management Tools:** These tools provide a central repository for storing, organizing, and managing documents related to teaching and learning. Platforms like GSuite, Google Docs, and Evernote offer cloud-based solutions for easy access and collaboration.
vii. **Video Tools:** Online video tools enable the recording and sharing of lecture videos, enhancing accessibility and flexibility in learning. Platforms such as YouTube and Zoom support video-based learning experiences, allowing students to revisit lectures and review content at their own pace.

Significance of Online Educational Tools

The significance of online educational tools lies in their ability to transform teaching and learning experiences, providing educators and students with innovative resources and opportunities. These tools offer several benefits that contribute to the effectiveness and efficiency of education:

i. **Flexibility and Accessibility:** Online tools provide flexible learning options and accessibility to educational resources, accommodating diverse learning styles and preferences. Students can access learning materials anytime, anywhere, fostering a personalized learning experience (Hodges *et al.*, 2020).
ii. **Enhanced Engagement:** The interactive nature of online tools promotes active engagement and participation among students, leading to improved motivation, collaboration, and knowledge retention (Kebritchi *et al.*, 2017).
iii. **Efficient Communication:** Online communication tools facilitate seamless communication between educators and students, allowing for timely feedback, instructions, and discussions. This promotes effective teaching practices and student support.
iv. **Resource Optimization:** Online tools streamline administrative tasks, such as scheduling, grading, and document management, optimizing time and resources for educators and students (Means *et al.*, 2013).
v. **Environmental Sustainability:** The digital nature of online tools reduces the need for printed materials, contributing to environmental sustainability by minimizing paper usage and waste (Allen & Seaman, 2017).
vi. **Customization and Personalization:** Online tools offer customization options for creating tailored learning experiences, catering to individual student needs, preferences, and learning goals (Laurillard, 2012).
vii. **Continuous Learning:** Through online platforms, learning can continue seamlessly during disruptions such as pandemics or natural disasters, ensuring continuity in education and learning outcomes (Hodges *et al.*, 2020).

Trends and Developments in Online Education Globally

The landscape of online education is continuously evolving, driven by technological advancements, pedagogical innovations, and changing educational needs. Globally, several trends and developments are shaping the future of online learning:

i. **Integration of Artificial Intelligence (AI) and Machine Learning:** AI-powered tools and algorithms are being integrated into online

platforms to personalize learning experiences, automate administrative tasks, and provide intelligent feedback and recommendations to students and educators (Hodges *et al.*, 2020).

ii. **Expansion of Virtual Reality (VR) and Augmented Reality (AR) Technologies:** VR and AR technologies are revolutionizing online education by offering immersive learning experiences, simulations, and virtual laboratories that enhance student engagement and understanding of complex concepts (Means

Online Learning in Higher Education

The integration of Information and Communication Technology (ICT) in education has evolved significantly, marking transformative milestones in how knowledge is accessed and disseminated. The early adoption of computer-based applications, such as flight simulators, laid the groundwork for asynchronous learning methods where students could engage with educational content at their own pace and convenience (Keegan, 1996). This asynchronous approach was further enhanced with the proliferation of personal computers like the Apple II and the emergence of the Internet in the 1990s, ushering in an era of online education (Garrison & Vaughan, 2008).

The rapid advancements in technology have led to a diverse array of tools and platforms used in online learning in higher education. Laptops, tablets, interactive whiteboards, e-readers, and virtual classrooms have become integral components of modern education (Simonson *et al.*, 2019). These technologies offer flexibility and accessibility, allowing students to engage with course materials from anywhere, at any time. For instance, the use of interactive whiteboards facilitates real-time collaboration and visual learning experiences, enhancing student engagement (Johnson & Watson, 2011).

The advent of Web 2.0 technologies, characterized by user-generated content and social media platforms, has further revolutionized online learning (Selwyn, 2011). Platforms like blogs, wikis, and social networking sites enable collaborative learning environments where students can share ideas, collaborate on projects, and engage in peer-to-peer learning (Veletsianos & Kimmons, 2012).

Digital literacy plays a pivotal role in leveraging ICT effectively for educational purposes (Bawane & Spector, 2009). Educators need to be proficient in using technology to design engaging and interactive learning experiences (Mishra & Koehler, 2006). Professional development programs and workshops can equip teachers with the necessary skills to integrate ICT seamlessly into the curriculum (Ertmer *et al.*, 2012).

The rise of e-learning as a form of remote education technology has further expanded the landscape of online learning in higher education (Ally, 2008). Synchronous e-learning platforms, such as video conferencing tools and virtual classrooms, enable real-time interactions between instructors and students, fostering immediate feedback and collaboration (Tallent-Runnels *et al.*, 2006). Conversely, asynchronous e-learning offers flexibility, allowing learners to access course materials and participate in discussions at their convenience (Means *et al.*, 2010).

Various types of e-learning, including Computer-Based Training (CBT), mobile learning, and flipped classrooms, cater to diverse learning styles and preferences (Clark & Mayer, 2016). These modalities offer advantages such as cost-effectiveness, scalability, and personalized learning experiences (Bates, 2015). Online learning in higher education continues to evolve with advancements in technology and pedagogy. While it offers significant benefits in terms of accessibility, flexibility, and collaboration, addressing challenges related to digital literacy, infrastructure development, and learner engagement is crucial for maximizing its potential impact on education.

Best Practices in Online Learning

Effective implementation of online learning in higher education requires adherence to best practices that optimize student engagement, learning outcomes, and overall educational experience. These best practices encompass instructional design strategies, technological integration, and pedagogical approaches tailored to the online learning environment.

i. **Pedagogical Alignment:** Online courses should align instructional content, assessments, and activities with learning objectives to ensure coherence and relevance (Mandernach *et al.*, 2017). Employing a backward design approach, where course outcomes guide content development, fosters a clear and purposeful learning trajectory (Wiggins & McTighe, 2005).

ii. **Interactive Course Design:** Incorporating interactive elements such as multimedia resources, simulations, and discussion forums promotes active learning and student engagement (Dennen *et al.*, 2007). Utilizing multimedia content enhances comprehension and retention, catering to diverse learning styles (Mayer, 2009).

iii. **Collaborative Learning Opportunities:** Facilitating collaborative activities such as group projects, peer reviews, and virtual teamwork cultivates a sense of community and promotes social interaction among students (Harasim, 2012). Collaborative learning environments foster critical

thinking, communication skills, and teamwork abilities (Gokhale, 1995).

iv. **Accessible and Inclusive Design:** Ensuring course materials and technologies are accessible to students with diverse abilities and needs is essential for inclusivity (Burgstahler & Cory, 2008). Incorporating universal design principles and providing alternative formats for content accessibility enhances the learning experience for all learners (Burgstahler, 2015).

v. **Regular Feedback and Assessment:** Implementing timely and constructive feedback mechanisms, including formative assessments and self-assessment tools, supports continuous learning and improvement (Nicol & Macfarlane-Dick, 2006). Feedback should be specific, actionable, and aimed at enhancing student understanding and performance (Sadler, 1989).

vi. **Technology Integration:** Leveraging appropriate technology tools and platforms that facilitate seamless communication, content delivery, and collaboration enhances the online learning experience (Bonk & Graham, 2006). Training faculty and students to use technology effectively promotes digital fluency and reduces technological barriers (Bates, 2015).

vii. **Ongoing Professional Development:** Providing faculty with ongoing training, support, and resources for online teaching practices and technological advancements ensures instructional quality and innovation (Conceição, 2006). Continuous professional development fosters a culture of lifelong learning and adaptation to evolving educational trends (Bullen *et al.,* 2012).

viii. **Evaluation and Iterative Improvement:** Conducting regular evaluations of online courses through student feedback, learning analytics, and peer reviews enables iterative improvements and ensures alignment with evolving educational needs (Allen & Seaman, 2014). Continuous evaluation and refinement contribute to the enhancement of online learning effectiveness and student satisfaction.

By incorporating these best practices, institutions can optimize the quality, accessibility, and effectiveness of online learning experiences in higher education, thereby empowering students and faculty to thrive in digital learning environments.

Empirical Studies on Online Tools in Education

The integration of online educational tools (OET) into educational systems has sparked considerable interest in understanding their impact on teaching and learning processes. Scholars have conducted empirical studies to explore students' perceptions, experiences, and challenges with these tools, shedding light on both the benefits and limitations they present.

One key aspect of these studies is the examination of students' perceptions regarding the effectiveness and usability of online tools. Galway *et al.,* (2014) and Hilton (2009) highlight the potential of OET to enhance learner engagement, democratize access to education, and improve learning outcomes. Conversely, Selwyn (2007) emphasizes the need for caution, suggesting that excessive use of OET in classrooms may lead to distractions and limited impact on learning outcomes.

Kapłon (2020) conducted a study on students' perceptions of online learning during the COVID-19 pandemic in Poland, revealing challenges related to technical issues among students who were previously unfamiliar with eLearning. This underscores the importance of adequate training and support for students transitioning to online platforms.

Similarly, Shetty, Shilpa, Dey, and Kavya (2020) surveyed undergraduate students in India during the pandemic, finding favourable attitudes towards online learning despite challenges such as lack of face-to-face interactions and technological issues. In contrast, Abbasi *et al.,* (2020) observed negative perceptions towards e-learning among students at Liaquat College of Medicine and Dentistry during lockdowns, emphasizing the need for improvements in online education strategies.

The availability of diverse learning materials through OET, such as e-textbooks and online lectures, has garnered mixed responses among students. Mutiara (2020) notes varying perceptions of the helpfulness of these materials, highlighting the importance of contextual relevance and ease of access. Elyas (2018) and Lin and Lin (2015) further emphasize the role of well-designed, interactive e-learning environments in promoting independent learning and engagement.

However, challenges persist regarding the optimal use of OET. Ayu (2020) discusses difficulties faced by students in understanding complex learning materials through online lectures, citing limitations in direct interaction with instructors and peers. The effectiveness of online forums as educational tools also depends on factors such as system consistency and technical support (Ayu, 2020).

Instructors' perspectives on OET implementation are crucial for understanding the challenges and opportunities in online education. Davis *et al.,* (1992) emphasize the importance of teacher acceptance and active involvement in utilizing online tools effectively for teaching and learning. Harjanto and Sumarni (2019) echo this sentiment, highlighting the need for proper planning and training to maximize the benefits of technology-enhanced learning environments.

Cloud computing has emerged as a significant enabler of online education, offering scalability, flexibility, and accessibility to learning resources (Sultan, 2010; Allen, 2011). However, challenges related to infrastructure, internet access, and device affordability remain pertinent, especially in developing countries like Nigeria (User, 2024).

Despite the potential of OET to revolutionize education by overcoming geographical barriers and offering flexible learning options, questions remain regarding their ability to fully replicate the interactive and immersive nature of traditional face-to-face learning environments. Ongoing research and strategic implementation strategies are necessary to harness the benefits of OET while addressing inherent challenges and disparities in access and infrastructure.

Theoretical Framework and Models of Online Learning

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is a widely recognized theoretical framework for understanding users' acceptance and adoption of new technologies, including online educational tools. Initially proposed by Fred Davis in 1986, TAM focuses on two key factors influencing an individual's intention to use technology: perceived ease of use (PEOU) and perceived usefulness (PU) (Charness & Boot, 2016).

Perceived Ease of Use (PEOU)

PEOU refers to the user's perception of how easy or difficult it is to use a particular system or technology. This aspect of TAM is crucial because it directly impacts an individual's motivation and willingness to engage with the technology (Al-Bashayreh *et al.,* 2022). For online educational tools, PEOU encompasses factors such as user interface design, system navigation, and overall user experience. Research by Venkatesh (2000) further emphasizes the importance of self-efficacy and facilitating conditions in determining PEOU, highlighting that users should feel confident and supported in using the technology.

Perceived Usefulness (PU)

PU relates to the user's belief in the effectiveness and benefits of using a specific technology. In the context of online learning, PU reflects how students perceive the utility of online educational tools in enhancing their learning outcomes and experiences (Chen & Tseng, 2012). Benefits associated with PU in e-learning include access to resources anytime, anywhere, collaborative features for sharing materials, and the ability to focus on tasks without distractions commonly found in traditional classrooms (Gilbert, 2015; Heggart & Yoo, 2018).

Application of TAM in Online Learning

Numerous studies have applied TAM to assess students' acceptance and perception of online educational tools. Laurencia & Sudarto (2021) and Mahamud *et al.,* (2021) explored how PEOU and PU influence students' behavioural intention and actual use of platforms like Google Meet. These studies highlight the significance of PEOU and PU in shaping students' attitudes and behaviours towards online learning tools.

Technology Acceptance Theory in Practice

While TAM provides valuable insights into technology acceptance, it's essential to recognize its limitations. Goodhue (2007) notes that while increased technology utilization often correlates with improved performance, this relationship may not hold in all cases. Additionally, Benbasat & Barki (2007) emphasize the importance of considering not just the utility of technology but also its alignment with users' learning activities and relationships.

Integration with Innovation Diffusion

Johnson & Payne (1985) integrated TAM with concepts from innovation diffusion theory, highlighting the role of perceived benefit versus effort in determining technology adoption. This integration underscores the complexity of users' decision-making processes regarding technology acceptance.

TAM provides a robust theoretical framework for understanding users' acceptance of online educational tools. By considering factors such as perceived ease of use, perceived usefulness, and the alignment of technology with users' needs and activities, educators and designers can enhance the adoption and effectiveness of online learning platforms.

METHODOLOGY

The study relied on data collected from 260 students of Obafemi Awolowo University, Ile-Ife, through questionnaire administration, using a multi-stage sampling procedure. In the first stage, quota sampling was adopted with the allocation of 20 respondents to each faculty. Systematic random sampling was then used to select the 20 respondents from each faculty. The data collected were analysed using descriptive (mean score) and inferential (chi-square) statistics.

Data Presentation and Analysis

Data were collected with respect to the specific objectives of the study; namely, to (i) identify online tools deployed in Obafemi Awolowo University, Ile-Ife, (ii) ascertain the areas of application of the tools, (iii) assess the effect of the tools on students' leaning outcomes in the University, and (iv) analyse the challenges associated with the application of the tools in Obafemi Awolowo University. The data collected are presented and analysed as follows.

The Online Educational Tools Deployed in Obafemi Awolowo University, Ile-Ife

To achieve this objective, the respondents were requested to identify the specific online tools they have been exposed to as well as the frequency of their use. The tools identified and their frequency of use, as shown in Table 1 are e-Zone, Google Classroom, Google Meet, Microsoft Teams, Zoom, Moodle, and Blackboard. Points are allocated to each option as a frequently used tool attracts 2 points, a rarely used tool attracts 1 point while a tool scores 0 for having never been used. The percentages of students' responses to each tool were computed and used to obtain the mean score for each tool with which the final decision was taken. The computation reveals that only Google Classroom and Google Meet were frequently used for undergraduate academic activities in Obafemi Awolowo University, Ile-Ife during the period covered by the study. Others were rarely used.

Table 1: Online Educational Tools Deployment in Obafemi Awolowo University, Ile-Ife

Tools	Frequently Used (2)	Rarely Used (1)	Never Used (0)	Mean Score	Decision
	%	%	%		
e-Zone	8.2	79.6	12.2	**1.0**	Rarely Used
Google Classroom	94.1	4.0	2.0	**1.9**	Frequently Used
Google Meet	75.2	8.9	15.8	**1.6**	Frequently Used
Microsoft Teams	11.5	77.1	11.5	**1.0**	Rarely Used
Zoom	37.5	34.4	28.1	**1.1**	Rarely Used
Moodle	6.3	88.5	5.2	**1.0**	Rarely Used
Blackboard	15.8	77.9	6.3	**1.1**	Rarely Used

Source: Field Survey, 2023

The Areas of Application of Online Educational Tools in Obafemi Awolowo University

In the areas of application of the tools, the survey identified the different uses of the tools in teaching and learning activities and requested the respondents to indicate the extent of application of the tools in each area. The areas of application identified include lectures, assignments, examinations, quizzes, and information dissemination. Others are document storage, discussion fora, and feedback loop. The extent of application and point awarded range from 'not applied (0)', through 'little extent (1), 'large extent (2), to 'very large extent (3). Table 2 shows the descriptive analysis of the responses to the questions. It reveals that, during the study period, online educational tools were mostly applied (large extent) for lectures, assignments and information dissemination. They were applied to little extent in all other areas.

Table 2: Areas of application of online educational tools in the University

Activity	Not applied (0)	Little extent (1)	Large extent (2)	Very large extent (3)	Mean Score	Decision
	%	%	%	%		
Lectures	4.0	42.6	31.7	21.8	**1.7**	Large Extent
Assignment	1.0	48.5	35.6	14.9	**1.6**	Large Extent
Examination	33.7	36.7	11.9	17.8	**1.1**	Little Extent
Quizzes	21.8	62.4	9.9	5.9	**1.0**	Little Extent
Information Dissemination	5.9	57.4	20.8	15.8	**1.5**	Large Extent
Document Storage	11.0	59.0	20.0	10.0	**1.3**	Little Extent
Discussion Forum	25.7	46.5	25.7	2.0	**1.0**	Little Extent
Feedback Loop	33.7	45.6	17.8	3.0	**0.9**	Little Extent

Source: Field Survey, 2023

The Effects of the Online Educational Tools on Students' Learning Outcomes in the University

Deployment of online educational tools is expected to have a significant positive effect on learning outcomes in the institution of learning. In this section, the study assesses the effect of the application of the tools on students' learning outcomes in the university. Expected effects are enumerated as (i) improved academic performance through unhindered access to resources, flexibility, convenience and engagement/interactivity, (ii) promotion of students' skill development through digital literacy and critical

thinking and problem-solving, (iii) enhancement of international collaboration and communication through collaborative learning and global connectivity, (vi) promotion of accessibility and inclusivity by providing equal opportunities and reach to remote areas, (v) motivation of students and promotion of their self-regulation through self-paced learning and self-discipline, (vi) saving of resources in terms of cost and time, (vii) resolving the problem of inadequate lecture venues in the University, (viii) promotion of collaboration between teachers and students in the University.

Respondents were requested to agree or disagree with the claims that each of the effects was realized as a result of the deployment of the deployment of online educational tools in the University. Table 3 shows the analysis of the responses. The level of agreement/disagreement is rated as: 'Strongly Agree (4)', 'Agree (3)', 'Disagree (2)', and 'Strongly Disagree (1)'. As shown in Table 3, the analysis shows no area of strong agreement for the mean score. This means that there was no area of strong effect of the application of the tools on average. However, there was agreement that its effect is seen in six (6) out of the eight (8) areas considered. In their order of magnitude, these are (i) students' motivation and promotion of self-regulation, (ii) improvement in students' academic performance, (iii) students' skill development, (iv) promotion of accessibility and inclusivity, (v) resource-saving, and (vi) solving the problem of inadequate lecture venues. Conversely, in the areas of enhancing international collaboration and communication, and promotion of collaboration between teachers and students, respondents disagreed with it having any effect.

Table 3: Effects of online educational tools on students' learning outcomes in O.A.U., Ile-Ife

	Strongly Disagree (1)	**Disagree (2)**	**Agree (3)**	**Strongly Agree (4)**	**Mean Score**	**Decision**
	%	%	%	%		
It has improved academic performance through unhindered access to resources, flexibility, convenience and engagement/interactivity	3.0	7.0	55.0	35.0	3.2	Agree
It promoted students' skill development through digital literacy critical thinking and problem-solving	3.0	27.3	48.5	21.2	2.9	Agree
It has enhanced international collaboration and communication through collaborative learning and global connectivity.	0.0	54.0	18,0	28.0	2.2	Disagree
It has promoted accessibility and inclusivity by providing equal opportunities and reach to remote areas.	4.0	27.0	47.0	22.0	2.9	Agree
It motivated students and promoted their self-regulation through self-paced learning and self-discipline	0.0	8.0	55.0	37.0	3.3	Agree
It has saved resources in terms of cost and time.	12.0	31.0	44.0	13.0	2.6	Agree
It has solved the problem of inadequate lecture venues in the University	9.1	29.3	51.5	10.1	2.6	Agree
It has promoted collaboration between teachers and students in the University	12.4	43.3	37.1	7.2	2.4	Disagree

Source: Field Survey, 2023

Test of Hypothesis

Furtherance to the descriptive statistics in Table 3, a one-sample *t*-test is carried out to measure the significance of the difference between the effects of deployment of online educational tools in the University as quantified in the mean score and a test value of 3.0 representing the score for a positive effect. Thus, a null hypothesis is stated that the application of online educational tools had no significant effect on students' learning outcomes in Obafemi Awolowo University, Ile-Ife.

The *t*-test statistics are shown in Table 4 and Table 5. Table 4 shows the descriptive statistics of the test, revealing that scores for 8 effects are tested; and the mean score (performance) is 2.7625. Table 5 shows the test value of 3.0, which is the score for a positive effect. The average score of the effects of the deployment is 0.2375 less than the test value as indicated by the negative sign. The lower value of the effect notwithstanding, to determine whether the difference is significant, reference is made to other figures in Table 5. A p-value of 0.122 is greater than 0.05 implying that the difference is not significant. Also, the 95% confidence interval of -0.5564 and 0.0814, which indicates an inclusion of 0, implies an absence of a significant difference between the two means. In conclusion, the

effect of the deployment of online educational tools in O.A.U. is not significantly different from the test value.

H₀: Application of online educational tools had no significant effect on students' learning outcomes in Obafemi Awolowo University, Ile-Ife

Table 4: One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Effects	8	2.7625	.38149	.13488

Table 5: One-Sample Test

	Test Value = 3.0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Effects	-1.761	7	.122	-.23750	-.5564	.0814

Challenges Associated with the Application of the Online Educational Tools in Obafemi Awolowo University, Ile-Ife

The foregoing analysis of the effects of the deployment of online educational tools in the University reveals that there is room for improvement. This simply suggests that challenges exist in the application of the tools. In this section of the paper, challenges associated with the application of the tools are analysed from the students' perspective. The challenges analysed, as shown in Table 6, include weak ICT knowledge of lecturers, poor internet connection, irregular electricity supply, poor time management, absence of motivation, low students' engagement, and poor digital literacy of the students. Using a Likert scale of 1 to 4 (strongly disagree to strongly agree), the result shows that the most potent challenge confronting the application of online educational tools in the University during the study period is poor internet connection. Other challenges, in their order of magnitude, are irregular electricity supply, low students' engagement, absence of motivation, and poor time management.

Table 6: Challenges of Online Educational Tools in Obafemi Awolowo University, Ile-Ife

Challenge	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)	Mean Score	Decision
	%	%	%	%		
Weak ICT knowledge of lecturers	25.7	52.7	15.4	6,2	2.0	Disagree
Poor internet connection	3.3	4.3	31.5	60.9	3.5	Strongly Agree
Irregular electricity supply	3.3	15.2	33.7	47.8	3.3	Agree
Poor time management	8.8	37.4	36.3	17.6	2.7	Agree
Absence of motivation	6.5	33.7	42.4	17.4	2.7	Agree
Low students engagement	2.2	26.7	53.3	17.8	2.9	Agree
Poor digital literacy of the students	28.6	56.0	14.3	1.1	1.9	Disagree

Source: Field Survey, 2023

DISCUSSION OF FINDINGS

The findings of the study are in tandem with what are obtainable in literature though with a few variations in some areas. This study's finding that application of online educational tools has improved academic performance through unhindered access to resources, flexibility, convenience and engagement/interactivity is in line with Hodges *et al.*, (2020), who observed that online tools provide flexible learning options and accessibility to educational resources, accommodating diverse learning styles and preferences. Students can access learning materials anytime, anywhere, fostering a personalized learning experience. This is also in line with Kebritchi *et al.*, (2017) and Mutiara (2020). Kebritchi *et al.*, argue that the interactive nature of online tools promotes active engagement and participation among students, leading to improved motivation, collaboration, and knowledge retention.

The challenge of technical issues identified by the study fell in line with Kapłon (2020), whose study on students' perceptions of online learning during the COVID-19 pandemic in Poland, revealed challenges related to technical issues among students who were previously unfamiliar with eLearning.

CONCLUSION

The study highlights the transformative impact that online educational tools in Obafemi Awolowo University, Ile-Ife have on the learning environment. The findings reveal that tools such as Google Classroom and Google Meet are frequently used, significantly enhancing accessibility, engagement, and collaboration among students, thus improving their academic

performance. Despite the clear benefits, challenges such as technical issues and the absence of motivation remain. Addressing these challenges through targeted support and infrastructure improvements is essential. The positive student perceptions underscore the potential of online educational tools to enhance learning outcomes when effectively integrated. This research underscores the need for continuous evaluation and adaptation to maximize the benefits of online educational tools in higher education, ensuring they meet the evolving needs of students and educators. As technology continues to evolve, so too must the strategies for its implementation, ensuring an inclusive and effective educational experience for all.

Recommendations

Based on the findings of this study, the following recommendations are proposed to enhance the application of online educational tools at Obafemi Awolowo University Ile-Ife:

i. **Technical Support and Training**: Provide comprehensive training for both students and faculty on effectively using online educational tools. Regular workshops and tutorials can help mitigate technical issues and improve overall user proficiency.
ii. **Infrastructure Improvement**: Invest in robust IT infrastructure to ensure stable internet connectivity and access to necessary hardware and software. This will facilitate seamless integration and use of online educational tools.
iii. **Enhanced Interaction**: To address the challenge of limited face-to-face interaction, incorporate more synchronous learning opportunities, such as live discussions and interactive sessions, to foster engagement and collaboration.
iv. **Feedback Mechanisms**: Implement regular feedback systems to gather insights from students and faculty about their experiences with online tools. This will help in making necessary adjustments and improvements.
v. **Inclusive Access**: Ensure all students have equal access to online tools by providing necessary resources and support, especially for those from disadvantaged backgrounds.

By adopting these recommendations, Obafemi Awolowo University can further enhance the effectiveness of online educational tools, creating a more inclusive, engaging, and efficient learning environment.

Suggestion for Further Studies

Future research can explore comparative studies with other universities to highlight best practices and challenges. Additionally, examining the impact of these tools across different academic disciplines and their role in enhancing digital literacy among students and faculty will provide deeper insights. Finally, investigating the socio-economic factors influencing access and utilization of online tools can help in addressing equity and inclusivity issues in online education.

REFERENCES

1. Abbasi, M. S., Ahmed, N., Sajjad, B., Alshahrani, A., Saeed, S., Sarfaraz, S., Alhamdan, R. S., Vohra, F., & Abduljabbar, T. (2020). E-Learning perception and satisfaction among health sciences students amid the COVID-19 pandemic. *Work*, *67*(3), 549-556.
2. Alabbadi, M. M. (2011). Cloud computing for education and learning: Education and learning as a service (ELaaS). In 2011 14th International Conference on Interactive Collaborative Learning (ICL) (pp. 589-594). IEEE.
3. Allen, I. E., & Seaman, J. (2014). Grade change: Tracking online education in the United States. Babson Survey Research Group and Quahog Research Group, LLC.
4. Allen, I. E., & Seaman, J. (2017). Digital learning compass: Distance education enrollment report 2017. Babson Survey Research Group, e-Literate, and WCET.
5. Ayu, M. A. (2020). Online learning: Leading e-learning at a time of crisis. *Journal of Chemical Information and Modeling*, *53*(9), 1689-1699.
6. Bates, A. W. (2015). Teaching in a digital age: Guidelines for designing teaching and learning. Tony Bates Associates Ltd.
7. Bonk, C. J., & Graham, C. R. (2006). *The Handbook of Blended Learning: Global Perspectives, Local Designs*. John Wiley & Sons.
8. Burgstahler, S. (2015). *Universal Design in Higher Education: From Principles to Practice.* Harvard Education Press.
9. Burgstahler, S., & Cory, R. C. (2008). *Universal Design in Higher Education*. Harvard Education Press.
10. Bullen, M., Morgan, T., Belfer, K., & Qayyum, A. (2012). Digital learners in higher education: Generation is not the issue. *Canadian Journal of Learning and Technology*, *37*(1).
11. Conceição, S. C. (2006). Faculty lived experiences in the online environment. *Adult Education Quarterly*, *57*(1), 26-45.
12. Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1992). Extrinsic and intrinsic motivation to use computers in the workplace. *Journal of Applied Social Psychology*, *22*(14), 1111-1132.
13. Dennen, V. P., Darabi, A. A., & Smith, L. J. (2007). Instructor–learner interaction in online courses: The relative perceived importance of particular instructor actions on performance and satisfaction. *Distance Education*, *28*(1), 65-79.
14. Elyas, T. (2018). The impact of online games on the learners' performance. *Journal of Educational Technology & Society*, *21*(3), 203-214.

15. Galway, L. P., Corbett, K. K., & Takaro, T. K. (2014). Roles of online learning in global health education. Global Health Action, 7(1), 24038.
16. Gokhale, A. A. (1995). Collaborative learning enhances critical thinking. *Journal of Technology Education*, *7*(1), 22-30.
17. Harasim, L. (2012). *Learning Theory and Online Technologies*. Routledge.
18. Harjanto, T., & Sumarni, S. (2019). Teachers' experiences on the use of Google Classroom. 3rd English Language and Literature. *International Conference (ELLiC) Proceedings*, *3*, 172-178.
19. Hilton, J. (2009). Open educational resources: A review of the literature. *Educational Technology Research and Development*, *57*(3), 331-338.
20. Hodges, C. B., Moore, S., Lockee, B. B., Trust, T., & Bond, A. (2020). The difference between emergency remote teaching and online learning. *Educause Review*, 27.
21. Kapłon, M. (2020). Students' perceptions of online learning during the COVID-19 pandemic. Educational Media International, 57(4), 295-312.
22. Kebritchi, M., Lipschuetz, A., & Santiague, L. (2017). Issues and challenges for teaching successful online courses in higher education. *Journal of Educational Technology Systems*, *46*(1), 4-29.
23. Laurillard, D. (2012). *Teaching as a design science: Building pedagogical patterns for learning and technology*. Routledge.
24. Lin, J. W., & Lin, H. H. (2015). The effect of different communication tools on the cooperative learning of learners and the development of educational networks. *The Turkish Online Journal of Educational Technology*, *14*(2), 37-43.
25. Mandernach, B. J., Dailey-Hebert, A., & Donnelli-Sallee, E. (2017). Best practices for online course design and delivery. In *Handbook of Research on Building, Growing, and Sustaining Quality e-Learning Programs* (pp. 25-47). IGI Global.
26. Mayer, R. E. (2009). *Multimedia learning*. Cambridge University Press.
27. Means, B., Bakia, M., & Murphy, R. (2013). *Learning Online: What Research tells us about Whether, When and How*. Routledge.
28. Mutiara, M. (2020). Online learning effectiveness in higher education: A survey of student perceptions. *International Journal of Emerging Technologies in Learning (iJET)*, *15*(6), 29-37.
29. Nicol, D. J., & Macfarlane-Dick, D. (2006). Formative assessment and self-regulated learning: A model and seven principles of good feedback practice. *Studies in Higher Education*, *31*(2), 199-218.
30. Sadler, D. R. (1989). Formative assessment and the design of instructional systems. *Instructional Science*, *18*(2), 119-144.
31. Selwyn, N. (2007). The use of computer technology in university teaching and learning: A critical perspective. *Journal of Computer Assisted Learning*, *23*(2), 83-94.
32. Shetty, S., Shilpa, M., Dey, D., & Kavya, M. (2020). Online learning amidst COVID-19 lockdown: Students' perspectives. *Journal of Business Management and Economics*, *8*(2), 20-24.
33. Sultan, N. (2010). Cloud computing for education: A new dawn? *International Journal of Information Management*, *30*(2), 109-116.
34. User, M. (2024). Challenges in online education: Perspectives from Nigerian higher institutions. *Journal of Online Learning and Teaching*, *20*(1), 50-60.
35. Wiggins, G., & McTighe, J. (2005). *Understanding by Design*. ASCD.