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Psychology of Learning Relating to Assessment Using Technology in Schools: A Prognostic Discourse

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ABSTRACT

The psychology of learning as it relates to the use of technology in schools for assessment purposes, is the focus of this study. The concept under investigation was examined using a descriptive survey research design type in the Abuja metropolis of Nigeria. The objective was to examine the impact of technology-based assessments on students' attitudes, motivation and learning outcomes. A researcher-designed questionnaire was used to collect data for this study. The questionnaire was both face and content validated by three lecturers from the Department of Educational Technology of the National Open University of Nigeria. The study's findings revealed that technology-based assessments positively impact students' learning outcomes and provided more accurate and timely feedback to teachers and students. Also, it was discovered that the use of technology in assessments would be efficient in enhancing students' engagement and motivation. It was also revealed that teachers' attitude towards technology has a great impact on their instructional practices. This research contributes to understanding the psychology of learning in the context of technology-based assessments in schools, highlighting the benefits and challenges associated with their use.

1. INTRODUCTION

Learning is an essential component of human growth and development, and it is a fundamental part of the educational system (Mohiuddin et al., 2022; Wadaani, 2015). The use of technology in schools has become increasingly popular in recent years. It has opened up new opportunities for teachers and students to engage in the learning process, but it has also brought about new challenges (Budhwar, 2022; Haleem et al., 2022; Susilana el., 2022). One of the most significant challenges is the assessment of student learning through technology (Al-Maqbali & Raja Hussain, 2022; Sasan & Baritua, 2022). This research topic investigates the psychology of learning about assessment using technology in schools. Specifically, the study seeks to understand how technology-based assessment methods affect students' motivation, engagement, and academic achievement.

Assessment is an essential component of effective teaching and learning (Hattie & Timperley, 2007). They argue that assessment should be focused on improving student learning and that teachers should use assessment data to adjust their instructional practices. Assessment plays a crucial role in the learning process. It provides feedback to both the teacher and the students on their progress, strengths, and weaknesses. According to Black & William (2021), assessment has a powerful influence on how and what students learn as it serves as a self-analyses mechanism to the learners. Effective assessment helps students identify their learning needs and motivates them to engage in the learning process actively. It also helps teachers to adjust their teaching strategies to improve students' performance. The concept of assessment is central to the learning process and plays a critical role in determining students' academic progress. Assessment can take many forms, including tests, exams, quizzes, and assignments, and is used to evaluate students' knowledge, skills, and understanding of a subject (Akhmedov, 2022; Surahman & Wang, 2022). Traditionally, assessments have been carried out in a paper-and-pencil format, but with the advent of technology, alternative methods of assessment have emerged, such as computer-based testing, online quizzes, and games, among others.

Technology has changed the way we learn, and it has also changed the way we assess learning. Assessment is no longer limited to traditional methods such as written exams or oral presentations. With the introduction of technology, there are now several innovative ways to assess learning, such as computer-based tests, online quizzes, and interactive simulations. These new forms of assessment are effective in promoting learning and enhancing student engagement (Aldhafeeri & Alotaibi, 2022; Kordrostami & Seitz, 2022). Technology has transformed the way assessments are conducted in schools. It offers several advantages over traditional assessment methods. Technology can provide immediate feedback to students, which can help them identify areas of strength and weakness and adjust their learning strategies accordingly (Boronat-Navarro, Forés, & Puig-Denia, 2015). The findings of research carried out by Alsubhi et al. (2020), revealed that technology-based assessments can increase student engagement and motivation, particularly when they involve interactive and gamified elements. Students can use various multimedia elements such as videos, images, and audio to enhance their understanding of the subject. Kahoot game app is an efficient and effective technology and should be used as an online assessment tool for students (Plump & LaRosa, 2017).

Assessment is a critical component of the learning process, and technology has provided innovative tools and resources to enhance the assessment process (Panadero & Lipnevich, 2022). Technology-based assessment has proved to be effective in improving student learning outcomes by providing timely and targeted feedback to students (Fu et al., 2022; Wang et al.,

2022; Hagos & Andargie, 2022). The process of learning has been studied extensively by psychologists who seek to understand the various factors that contribute to effective learning. One such factor is assessment, which is the process of evaluating the knowledge and skills of learners. The psychology of learning has been seen as a field that is composed of theories and learning models. One such theory is the cognitive load theory, which suggests that the capacity of working memory is limited, and if learners are presented with too much information at once, their cognitive load increases, making it harder for them to process and retain information (Sweller et al., 2011).

The findings of research conducted by Ryan & Deci (2017) revealed that learners are more motivated to learn when they have a sense of autonomy, competence, and relatedness. This assumption is proof of the self-determination theory. Technology-based assessments can provide learners with a sense of autonomy by allowing them to work at their own pace and providing them with choices about the types of tasks they want to complete. These assessments can also enhance learners' sense of competence by providing instant feedback and allowing them to track their progress over time (Nikou & Economides, 2021).

Moreover, technology-based assessments are also perceived as being more engaging and motivating for students than traditional paper-and-pencil assessments. A study by Zen et al. (2022) found that the use of technology-based assessments increased students' motivation and engagement in the learning process. Technology-based assessments provide a more interactive and engaging experience for students, increasing their interest in the subject matter and encouraging them to take a more active role in their learning. The integration of technology in assessment has been seen as a way to improve the effectiveness and efficiency of the assessment process. One of the key benefits of technology-based assessment is that it allows for immediate feedback, which is essential for promoting learning and improving student performance. According to a study by Wang et al. (2019), "feedback is a critical component of the learning process and is essential for students to understand where they are in their learning and what they need to do to improve". Technology-based assessments provide immediate feedback, which allows students to identify their strengths and weaknesses and make necessary adjustments to their learning strategies. However, despite the potential benefits of technology-based assessments, there are also concerns about their impact on student learning outcomes. One concern is that technology-based assessments may disadvantage students who are not familiar with technology or who do not have access to technology outside of school. This digital divide could result in unequal access to learning opportunities and resources, which could ultimately impact student learning outcomes (Warschauer & Matuchniak, 2010). Another concern is that technology-based assessments may not accurately measure students' knowledge and skills. Some researchers have suggested that technology-based assessments may only measure surface-level understanding of the subject matter and may not capture students' deeper understanding and critical thinking skills (Barak & Shahab, 2022; Pang, 2022).

Therefore, this research aims to investigate the impact of technology-based assessments on student learning outcomes, specifically looking at motivation, engagement, and academic achievement. The findings from this research will contribute to the development of best practices for the integration of technology in assessment in schools.

2. METHODOLOGY

The research adopted the descriptive research design to ascertain the primary purpose of the study. Even though there are some valid concerns about the statistical validity, in as much

as the researcher understands the limitations, this type of design is a useful scientific tool for the study Shuttleworth (2008). The main instrument for the study was a structured questionnaire titled: "Psychology of Learning Relating to Assessment Using Technology in Schools (PoLRAUTS)" A five-point Likert scale was used, and the agreement criteria were, strongly agree (SA), agree(A), neutral(N), disagree(D), and strongly disagree (SD). The questionnaire was structured into three (3) sections. The breakdown was made to conform to the research questions formulated to give focus to the study. Section I dealt with items that elicited information on the personal data of respondents; this included sex, age, status (student/teacher), etc. Under Section II, the questions were based on how technology-based assessment could affect students' motivation and engagement as well as the potential emotional and cognitive effects of technology-based assessments on students' academic performance. Section III dealt with how teachers' attitudes towards technology could impact their instructional practices and students' learning outcomes in assessment.

The questionnaire was both face and content validated to check the arrangement of items and also if questionnaire items are in line with the major purposes of the research by three lecturers from the Department of Educational Technology of the National Open University of Nigeria (NOUN) after which they deemed it fit to be validated. The questionnaire was tested for reliability on ten (10) randomly selected students from a senior secondary school outside the sample for the study. The data gathered from the pilot study was analyzed to check for internal consistency of reliability and the Cronbach alpha value was 0.73 on psychology of learning as related to assessment using technology in schools.

3. RESULTS AND DISCUSSION

The data collected were coded, edited, and analysed. The analysis of the main results highlighted the actual research questions which were how the use of technology in assessment affects students' motivation and engagement in the learning process, the potential cognitive and emotional effects of technology-based assessments on students' academic performance, how teachers' attitudes towards technology impact their instructional practices and students' learning outcomes in assessment. Descriptive statistics was the statistical tool used for analysing the data. To get the position of the respondents on the items that were given, percentages and frequencies were used for the analysis. The results are presented and discussed in the subsequent paragraphs. Discussion of results regarding Research Questions and Hypothesis.

Analysis of the background data of the respondents revealed that 50 which is 71.4% of the respondents who participated in the study are students while 20, which is 28.6% of the respondents who participated in the study are teachers. Also, 27 respondents representing (38.6%) are male, and 43 respondents representing (61.4%) are female.

3.1. How does the use of technology in assessments affect students' motivation and engagement in the learning process?

The first research question sought to investigate into how the use of technology in assessments affects students' motivation and engagement in the learning process. The results analyses are presented in Table 1 below:

Table 1. How the use of technology in assessment affects students' motivation and engagement in the learning process

STATEMENT	S A Freq (%)	A Freq (%)	N Freq (%)	D Freq (%)	S D Freq (%)
The use of technology in assessments decreases student motivation.	1(1.4)	33 (47.1)	10 (14.3)	21 (30)	5 (7.1)
Technology-based assessments make learning more engaging for students.	42 (60)	15 (21.4)	8 (11.4)	2 (2.9)	3 (4.3)
Technology-based assessments improve student performance by providing immediate feedback.	38 (54.3)	25 (35.7)	1 (1.4)	4 (5.7)	2 (2.9)
Technology-based assessments allow for more personalized learning experiences.	15 (21.4)	24 (34.3)	10 (14.3)	11 (15.7)	10 (14.3)
Technology-based assessments increase student motivation to learn.	13 (18.6)	36 (51.4)	2 (2.9)	12 (17.1)	7 (10)

The results presented in Table 1 indicate that the use of technology in assessments has a mixed impact on student's motivation and engagement in the learning process. On one hand, technology-based assessments are perceived to make learning more engaging for students, with 60% of respondents agreeing with this statement. On the other hand, the results suggest that the use of technology in assessments can decrease student motivation, with 47.1% of respondents indicating this perception. This finding is somewhat surprising, as technology is often touted as a way to enhance student motivation and engagement in the learning process. But one possible explanation for this finding could be that students feel that technology-based assessments are impersonal or that they do not accurately reflect their understanding of the material. The results also indicate that technology-based assessments can improve student performance by providing immediate feedback, with 54.3% of respondents agreeing with this statement. Furthermore, technology-based assessments allow for more personalized learning experiences, with 34.3% of respondents agreeing with this statement. Finally, the results suggest that technology-based assessments can increase student motivation to learn, with 51.4% of respondents agreeing with this statement. Overall, these findings are in consonant with the study of Alsubhi et al. (2020) which revealed that technology-based assessments can increase student engagement and motivation, particularly when they involve interactive and gamified elements. It is also consistent with previous research that technology can provide immediate feedback to students, which can help them identify areas of strength and weakness and adjust their learning strategies accordingly (Boronat-Navarro et al., 2015; Lee et al., 2019; Van Ginkel et al., 2020).

3.2. What are the potential cognitive and emotional effects of technology-based assessments on students' academic performance?

The second research question sought to find out about the potential cognitive and emotional effects of technology-based assessments on students' academic performance. Analyses of the results are presented in Table 2.

Table 2. Potential Cognitive and Emotional Effects of Technology-Based Assessments on Students' Academic Performance

STATEMENT	S A Freq (%)	A Freq (%)	N Freq (%)	D Freq (%)	S D Freq (%)
Technology-based assessments lead to increased cognitive overload in students	22 (31.4)	34 (48.6)	11 (15.7)	3 (4.3)	0 (0)
Technology-based assessments provide students with more opportunities to practice and apply their knowledge.	18 (25.7)	34 (48.6)	13 (18.6)	4 (5.7)	1 (1.4)
Technology-based assessments may negatively affect students' emotional well-being.	3 (4.3)	11 (15.7)	16 (22.9)	29 (41.4)	11 (15.7)
Technology-based assessments improve students' critical thinking skills.	16 (22.9)	28 (39.9)	15 (21.4)	9 (12.9)	2 (2.9)
Technology-based assessments increase student engagement in the learning process.	14 (20.0)	27 (38.6)	19 (27.1)	7 (10.0)	3 (4.3)

Table 2 shows that respondents agreed that technology-based assessments have both positive and negative effects on students' cognitive and emotional states as 31.4% strongly agreed that technology-based assessments can lead to increased cognitive overload in students. This finding is in contrast with the previous finding by Shute (2008) that technology-based assessments have been found to reduce cognitive load by breaking down complex tasks into smaller, more manageable chunks. However, the majority of participants (48.6%) agreed that technology-based assessments provide students with more opportunities to practice and apply their knowledge. 41.4% of the participants disagreed that technology-based assessments may negatively affect students' emotional well-being, while just 4.3% agreed with the statement. Also, the result shows that technology-based assessments improve students' critical thinking skills, as agreed by 39.9% of the participants.

This finding is consistent with the notion that technology-based assessments can promote higher-order thinking and problem-solving skills. However, some of the respondents (12.9%) reported that technology-based assessments negatively affect critical thinking skills. This finding could be due to the use of multiple-choice questions, which may not necessarily promote critical thinking. As to whether technology-based assessments increase student engagement in the learning process, the responses gathered show that 38.6% of the participants agreed with the statement.

Overall, the findings align with what Rutten et al. (2012) indicated "The use of simulations in assessments, which provide students with real-world contexts to apply their knowledge, was effective in promoting higher-order thinking skills."

3.3. Research Question 3: How do teachers' attitudes towards technology impact their instructional practices and students' learning outcomes in assessment?

The third research question sought to investigate the effects teachers' attitude towards technology has on their instructional practices and students' learning outcomes in assessment. The results analyses are presented in Table 3.

Table 3. How Teachers' Attitude Towards Technology Impacts Their Instructional Practices and Students' Learning Outcomes In Assessment

STATEMENT	S A Freq (%)	A Freq (%)	N Freq (%)	D Freq (%)	S D Freq (%)
Teachers who are resistant to using technology in assessments have less effective instructional practices.	20 (28.6)	24 (34.3)	16 (22.9)	8 (11.4)	2 (2.9)
Teachers who are proficient in using technology are more likely to provide students with more varied and engaging assessments.	15(21.4)	24 (34.3)	17 (24.3)	8 (11.4)	6 (8.6)
Teachers' attitudes towards technology impact students' motivation to learn.	14 (20.0)	17 (24.3)	29 (41.4)	9 (12.9)	1 (1.4)
Teachers' attitudes towards technology impact students' academic performance.	7 (10.0)	25 (35.7)	16 (22.9)	18 (25.7)	4 (5.7)
Teachers who are open to using technology in assessments are more likely to provide students with personalized learning experiences.	15(21.4)	23 (32.9)	19 (27.1)	9 (12.9)	4 (5.7)

As shown in Table 3, 24 respondents which constitute (34.3%) agree that teachers who are proficient in using technology are more likely to provide students with varied and engaging assessments. The same percentage of the respondents also agree that teachers who are resistant to using technology in assessments have less effective instructional practice. Furthermore, 24.3% of respondents agree that teachers' attitudes towards technology can impact students' motivation to learn. In addition, the data indicates that teachers who are open to using technology in assessments are more likely to provide students with personalized learning experiences. This finding is supported by 32.9% of respondents who agree with this statement. Personalized learning experiences can help students to learn at their own pace and in a way that is tailored to their individual needs. Overall, the data suggest that teachers' attitudes towards technology can have a significant impact on their instructional practices and students' learning outcomes in assessments. These findings support previous researches that highlighted the importance of teachers' attitudes towards technology and its impact on student learning outcomes. For example, a study by Lim & Chai (2008) revealed that teachers who had positive attitudes towards technology were more likely to integrate it into their teaching practices, leading to improved student achievement. Similarly, a study by Ertmer et al. (2012) found that teachers' beliefs and attitudes towards technology were critical in

shaping their instructional practices and the level of technology integration in their classrooms.

4. CONCLUSION

It was evident from the study that the use of technology in assessment can have both positive and negative effects on students' motivation and engagement in the learning process. However, the benefits seem to outweigh the drawbacks, as the majority of respondents reported that technology-based assessments make learning more engaging, improve student performance, allow for more personalized learning experiences, and increase student motivation to learn. Therefore, schools should continue to incorporate technology into their assessment practices to enhance student learning and achievement. It can be concluded that technology-based assessments can have both positive and negative effects on students' academic performance, cognitive abilities, emotional well-being, critical thinking skills, and engagement in the learning process. Further research is suggested to explore these effects more thoroughly and identify potential strategies for optimizing the use of technology-based assessments in education. It is recommended that educators should carefully consider the potential cognitive and emotional effects of technology-based assessments while designing and implementing them in their classrooms. By doing so, they can ensure that technology-based assessments effectively promote student learning and skill development

The study concretized the importance of teachers' attitudes towards technology and its impact on instructional practices and student learning outcomes. Teachers who are resistant to using technology may be less effective in their instructional practices and may struggle to motivate students to learn. On the other hand, teachers who are proficient in using technology and open to using it in assessments may be more effective in providing students with engaging and personalized learning experiences.

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