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****Original Research****

THE IMPACT OF QUIZZES ON IMPROVING MATHEMATICS PERFORMANCE AMONG HIGHER EDUCATION STUDENTS

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Abstract

This study investigates the role of mathematics quizzes in enhancing student academic performance at higher learning institutions, specifically focusing on the Institute of Accountancy Arusha (IAA). The research aims to determine whether frequent quizzes contribute to improved student engagement and better academic outcomes in mathematics modules. This study applied quantitative methods for data collection whereby first set of data came from quiz results, and the second set was obtained through a survey administered to students participating in the mathematics course. The findings indicate a significant positive relationship between the regular quizzes and increased student mathematics performance. Additionally, the data reveals that students who frequently participate in quizzes tend to achieve higher grades in mathematics. The study concludes that, integrating regular quizzes into the mathematics curriculum at higher learning institutions can be a strategic approach to improve academic performance. The recommendations include Utilizing online quiz platforms to make quizzes more accessible and to track student performance efficiently. Online quizzes can also provide instant results and analytics. Further research suggested exploring the long-term effects of quizzes on student learning out-comes across different disciplines and institutions.

Keywords: Regular quizzes, students' Mathematics performance and Higher Learning Institutions

1.0 INTRODUCTION

Students perform worse in end of semester mathematics exams at universities than in other courses. It is recognized that courses involving calculations such as mathematics require a lot of practice and close attention to the teacher's lectures. In addition, the number of students at many universities is so large that it is difficult to identify students who did not attend the class. Without the incentive of quizzes, students could not be motivated to attend lectures regularly, which would lead to low attendance rates (Braun & Sellers, 2012). According to Cook and Babon (2016), quizzes encourage participation and engagement with the course ma-terial. If they are not present, students could simply listen to lectures without participating or interacting with the material. In the event that quizzes are not provided, students may be less likely to prepare effectively for lectures, which could result in lower levels of preparation and participation in class discussions (Bognár, 2021).

Inquiries offer prompt feedback on students' weak points, enabling them to recognize and rectify comprehension gaps. Without quizzes, students could fail to understand key ideas and miss out on crucial learning opportunities. In order to help students identify areas for development, quizzes give them the opportunity to receive fast feedback on their performance (Roediger et al., 2011). The absence of quizzes may lead to reduced opportunities for timely feedback, potentially hindering the identification and correction of misconceptions. Feedback

is a critical component of learning, particularly in subjects like mathematics, where concepts build on one another (Fies & Marshall, 2018). Without frequent formative assessments like quizzes, students may struggle to measure their understanding of complex topics, resulting in difficulties during summative assessments such as final exams. Poor mathematics performance in higher learning institutions is a persistent challenge that affects student outcomes and aca-demic progress (Roediger et al., 2011).

The Institute of Accountancy Arusha (IAA), like other higher education institutions, faces major challenges in student achievement in mathematics, raising concerns about the effectiveness of current teaching methods and strategies. Given the importance of mathematics in areas such as accounting and finance, it is crucial for students to understand its concepts. To address these challenges, the article explores the potential benefits of incorporating regular quizzes as part of the formative assessment strategy. This approach aims to monitor student learning progress and provide ongoing feedback to help instructors identify areas where students are struggling and adjust their instruction accordingly. Regular quizzes could also create a more engaging learning environment by encouraging students to stay current with the material and consolidate their understanding through repetition. The aim of the study is to find out whether this strategy can improve students' mathematical skills and general academic performance, thereby better preparing them for future professional challenges.

2.0 OBJECTIVE OF THE STUDY

The purpose of this study is to evaluate the role of mathematics quizzes in improving mathematics performance in higher education. Specifically, the study aimed to evaluate the influence of regular mathematics quizzes on mathematics performance of students in higher education institutions by comparing the mathematics performance of students who took regular quizzes with those who followed the standard curriculum without additional quizzes.

3.0 LITERATURE REVIEW

This section examines the theoretical foundations and empirical evidence related to the role of mathematics quizzes in improving mathematics performance in higher education. By examining various educational theories and prior research, this literature review provides a comprehensive understanding of how and why quizzes can influence student engagement and achievement in mathematics.

Theoretical literature review on the role of quiz in academic assessment.

Test-based learning theory is based on the idea that recalling information improves long-term memory. Roediger and Butler (2011) argue that, common tests such as mathematics quizzes require students to retrieve information from memory. This process of retrieval improves memory because it strengthens the neural pathways associated with the material and makes it easier to recall in future assessments. Applying this theory in the context of this study shows that students who regularly take quizzes perform better on final exams than students who passively repeat the material. In a study by Roediger et al. (2011), students who took frequent tests demonstrated a 15–25% improvement in overall exam scores, suggesting a strong association between regular testing and improved performance.

Assessment of learning theory. Assessment theory provides a fundamental framework for understanding how learning, skills and competencies can be assessed in various contexts, particularly in education. It highlights the importance of using both formative and summative evaluation as a means of measuring student performance. Formative assessment, as described by Black and Wiliam (2018), focuses on using assessments such as tests to provide ongoing feedback that influences both teaching and learning. Quizzes generate quantitative data that helps both students and teachers identify learning gaps and opportunities for improvement (Xiao & Yang, 2019). For example, when students receive feedback on tests, they can adjust their study habits based on their performance. Likewise, teachers can use this data to modify instruction and focus on areas where students are struggling (Xiao & Yang, 2019).

Self-Regulated Learning Theory: Zimmerman (1990) suggests that quizzes promote self-regulated learning by encouraging students to reflect on their progress and adjust their strategies based on quantitative feedback. When students receive regular quiz results, they gain insight into their understanding of math concepts, allowing them to plan, monitor, and evaluate their own learning. This theory suggests that quizzes give students the opportunity to take control of their learning, set goals, and use performance data to guide their efforts. For example, if a student consistently performs poorly on certain types of problems, they may decide to devote more time to that area, ultimately improving their understanding and performance. Studies confirm that self-regulated learners who engage in quizzes show greater improvement in their math performance than their peers who do not engage in regular testing (Pintrich, 1999).

Empirical literature review on the influence of quizzes and immediate feedback on learning.
The study by Fies and Marshall (2018), highlights the immediate feedback provided by quizzes, which enables students to correct misconceptions and reinforce learning more effectively than traditional midterm exams. Their research, conducted at multiple universities, found that students who engaged in regular quizzes demonstrated better long-term retention of mathematical formulas and principles than those who only participated in final examinations. Similarly, Cheng (2019), supported these findings by demonstrating that quizzes could serve as an essential part of retrieval practice, aiding in the consolidation of knowledge. Also Brown (2021), revealed that adaptive quizzes, where questions are tailored to the learner's current understanding, improved student engagement and performance in undergraduate mathematics courses. Their research indicated that students who participated in adaptive quizzes were able to tackle more complex problems and showed a higher overall improvement in final assessments.

Moreover, online learning platforms, such as learning management systems (LMS), have incorporated regular quizzes to boost student participation in blended and online learning environments. Finally, a study by Patel and Singh (2023), highlighted the psychological benefits of quizzes, showing that frequent testing reduced math anxiety and improved students' confidence in handling mathematical problems. Their research in a higher learning context illustrated those students who engaged with low-stakes quizzes tended to perform better not just because of content mastery, but due to increased motivation and reduced stress levels. Wilkinson (2024) argue that formative assessments, such as quizzes, provide continuous feedback crucial for learning. Quizzes allow students to identify their strengths and weaknesses, enabling them to focus on areas that need improvement. Roediger and Butler (2011) also suggested that, frequent testing improves long-term retention and understanding, which translates into better academic performance.

Quizzes contribute to the development of self-regulated learning by helping students set goals, monitor their progress, and adjust their learning strategies. Self-regulated learners are more likely to achieve academic success due to their proactive approach to learning and ability to use feedback constructively (Zimmerman, 2002). Current studies by Panadero (2018), reinforce the importance of self-regulation in academic achievement and the role of continuous

assessment in fostering these skills. Regular quizzes encourage students to engage in consistent study habits rather than last-minute cramming (Saqware, 2024). This proactive approach to learning leads to better academic performance. Moreover Adesope (2017), found that students who took frequent quizzes were more likely to study regularly, leading to im-proved performance in mathematics courses.

Zimmerman (2002) emphasized the role of self-regulated learning in academic success. Quizzes help students develop effective study strategies by promoting goal setting, self-monitoring, and adaptive learning behaviors. Recent studies, such as those by Panadero (2018) confirm that continuous assessment encourages self-regulated learning and improves academic outcomes. A study by Leeming (2002) found that students who took frequent quizzes in introductory psychology courses achieved higher grades compared to those who did not. Similarly, Karpicke and Blunt (2011) reported that retrieval practice through quizzes improved students' performance in complex cognitive tasks. The testing effect, where fre-quent retrieval of information improves long-term retention, is well-documented. Roediger and Butler (2011) found that students who frequently engaged in retrieval practice through quizzes performed better on final exams. More recent research Adesope (2017), supports this finding, indicating that frequent quizzes lead to better retention and understanding of math-ematical concepts.

Black and Wiliam (2018) highlighted those formative assessments, such as quizzes, provide continuous feedback that helps students identify their strengths and weaknesses. This feedback loop is crucial for improving academic performance.

4.0 METHODOLOGY

This section outlines the methodology adopted for the study, detailing the research design, sampling, data collection methods, data analysis techniques, and procedures to ensure research quality.

Research design and approach

This study used a quantitative approach and cross-sectional research design to examine the role of mathematics quizzes in improving mathematics performance at Higher Learning Institutions.

Sampling

The target group of this study was 960 freshmen from the Faculty of Accountancy and Finance and the Faculty of Business management at the Institute of Accountancy Arusha. The sampling frame included four academic programs: Bachelor of Finance and Banking (BFB), Bachelor of Economics and Taxation (BET), Bachelor of Insurance and Risk Management (BIRM) and Bachelor of Marketing and Public Relations (BMPR). A total sample size of 620 students was randomly assigned to treatment group A (BFB and BET), which received quizzes, while 340 students were assigned to treatment group B (BIRM and BMPR), which did not receive quizzes. The simple random sampling technique ensured unbiased selection of par-ticipants for the two groups.

Data Collection Methods

This study used two primary data collection methods: quizzes and surveys. The quizzes results were used to collect formative assessment data from students in Treatment Group A, who completed a total of fourteen tests over a fourteen-week period. These quizzes aimed to assess their understanding of mathematics topics and provided immediate feedback after each quiz. The second method, a survey, was administered to all students in the mathematics course. This survey collected self-reported data about students' experiences with the assessments and their perceptions of formative assessment as a tool for self-reflection. In addition, the results of the mathematics test at the end of the semester were documented for all participants by using a checklist.

Data Analysis

The data analysis methods used in this study were both descriptive and inferential statistics. Descriptive statistics, including frequency, percentage, and mean, were used to summarize the quiz results and compare student performance between the two groups. Graphical representa-tions were used to visually illustrate the performance differences. An inferential analysis was conducted using Microsoft Excel to determine the statistical significance of the results and to assess the impact of quizzes on overall student performance. The analysis specifically ad-dressed the study's objectives and hypotheses by comparing the quiz and exam results of treatment groups A and B.

Quality Procedures

To ensure the validity and reliability of the study, several measures were taken. Multiple data

collection methods were used, including quizzes and surveys, which increased the credibility of the results. Incorporating multiple data sources, such as quiz results and self-reported survey responses, enabled triangulation and increased the validity of the study. Prior to the main research, a pilot study was conducted to test the data collection instruments and refine them for better accuracy. In addition, steps were taken to minimize bias in sampling and data collection and to ensure that the results of the study are reliable and can be generalized to similar populations.

5.0 RESULTS

This section presents the results of the study. The main purpose of the study was to examine the impact of mathematics quizzes on academic performance in mathematics in higher education institutions, particularly at the Institute of Accountancy Arusha (IAA). The study used two primary data collection methods, namely grades from quiz results and surveys distributed to all students through questionnaires. Quiz results were used to collect data from Treatment Group A students who completed a total of fourteen quizzes over a fourteen-week period, while surveys were used to assess students' perceptions of regular quizzes as a self-assessment tool. The first section (5.1) shows the results from quiz recordings and the second section (5.2) shows the results of the student survey.

Data from Quiz Records

The results from Group A students revealed that, there was a positive relationship between mathematics quizzes and students performance. The average score of all fourteen quizzes for 620 students is 65.08% while their average final exam score is 78.5% indicating that, the use of quizzes positively impacts student achievement in Mathematics subject. Similarly, the results from Group B students indicate that, students' performance on the final examination is lower due to the lack of quizzes, keeping other factors constant. This is shown in Figure 2 and 3 respectively.

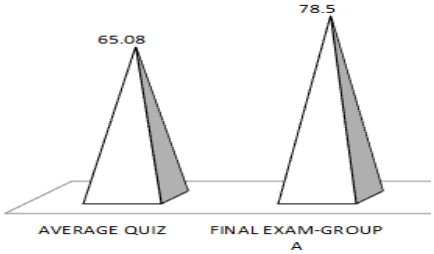

Figure 2. Pyramid graph that shows a comparison between average quiz and treatment group A.

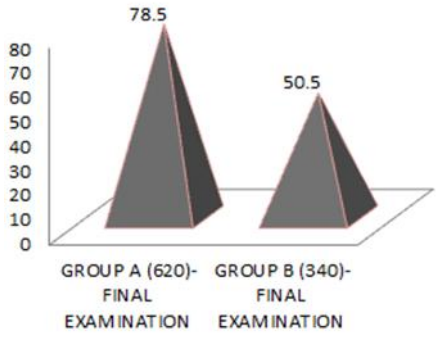

Figure 3; Pyramid graph that shows a comparison between treatment group A (with quizzes) and treatment group B (without quizzes).

Student surveys on the role of regular tests on academic performance

A questionnaire was distributed to all students to obtain their perceptions on the benefits of regular testing for mathematics learning in the classroom. Students expressed their preference for regular testing and 78% of students agreed that testing should be used as assessment criteria in all mathematics modules. The following subsections discuss elements that explain students' perceptions of the role of testing in their performance.

The perception of student on the use of quizzes to improve their academic performance.

This subsection presented the results of students' perceptions of the use of quizzes in the context of the learning process. The goal is to find out how quiz questions affect the learning process. The details of the result are given in figure 1.

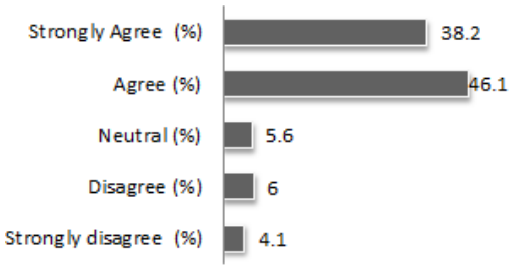

Figure 1: The perception of student on the use of quizzes

The results show that frequent quizzing had a positive impact on students' learning experience without causing stress. The majority of students (46.1%) agreed and 38.2% strongly agreed that regular testing had no negative impact on them. This result shows that frequent quizzing

was beneficial for the students. Regular testing can help students gradually expand their understanding of material by breaking complex topics into manageable chunks. This method reduces last-minute study stress before exams by allowing students to continually engage with the material. Moreover, frequent quizzes provide immediate feedback so students can identify their strengths and areas for improvement. This approach creates a learning loop in which students can continually monitor their progress. Regular testing may have made students feel more prepared, which ultimately increased their confidence and performance.

The preference of students on the use of quizzes as an instructional Approach

This part presents results on the preference of students to use quizzes as an instructional approach in mathematics. Details about results of the analysis are presented in Figure 2.

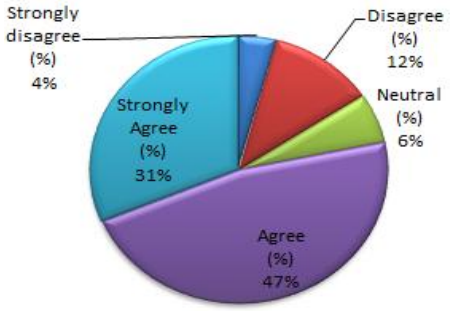

Figure 2: The preference for every module to use quizzes in learning

The majority of students stated that they found the integration of quizzes into mathematics modules positive. Approximately 47% agreed and 31% strongly agreed that integrating quizzes could lead to improved performance. This feeling reflects a belief that regular assessment can benefit their learning. By introducing regular testing across various modules, particularly in mathematics, students feel they have more opportunities to expand their understanding of the material and identify areas where they may need additional support. This feedback suggests that students recognize the potential benefits of testing in not only increasing their academic performance but also improving their overall learning experience.

Regular tests contribute positively to building learning ability.

This subsection presents the relationship between regular quizzes and the student learning ability. The detailed of the analysis is indicated in figure 3.

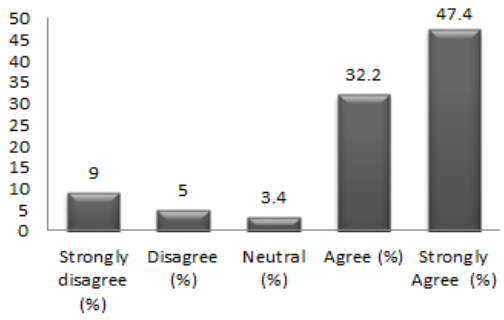

Figure 3: Relationship between regular quizzes and learning ability.

The results showed that 47.4% of students strongly agreed and 32.2% agreed that regular testing improves learning ability, highlighting the positive influence of regular testing on academic habits. Regular quizzes encourage students to stay consistent with their studies, making learning an ongoing process rather than a last-minute effort before final exams. This approach helps students develop structured study routines by regularly preparing and reviewing material to succeed on each quiz. Additionally, regular testing with timely feedback helps students identify areas that need further investigation and focus on areas of weakness. By understanding their performance through frequent assessments, students can adapt their learning strategies more effectively, thereby strengthening their self-assessment and reflection skills. Overall, the regular quiz format encourages disciplined, focused study habits that are essential for long-term academic growth.

The quiz questions promote active participation in mathematics lessons

This part shows the connection between regular testing and students' active participation in mathematics lessons. The result of the investigation is shown in Figure 4.

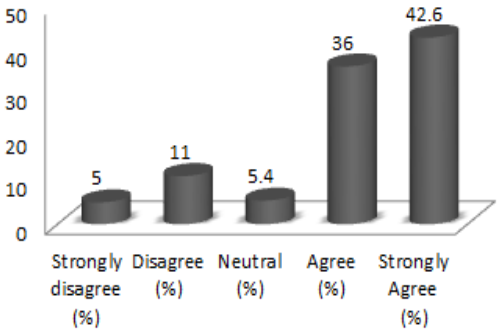

Figure 4: The quiz questions promote active participation in mathematics lessons

The results show that 42.6% of students strongly agreed and 36% agreed that quizzes encouraged them to actively participate in math class. This highlights the motivating role that assessments play in the learning process. Quizzes often create a sense of ownership and cause students to become more engaged with the material and their peers. Knowing that their understanding will be tested can encourage students to participate in class discussions, ask questions, and collaborate with classmates to prepare effectively. Additionally, the interactive nature of testing can promote a more dynamic classroom environment. When students are actively involved, they are more likely to absorb and retain information, leading to a deeper understanding of mathematical concepts. This engagement can also help build a supportive learning community where students feel comfortable sharing their ideas and challenges.

Discussion of Findings

The finding that Group A students who frequently took tests performed better on both tests (65.08%) and final exams (78.5%) than Group B students who did not take tests underlines the positive influence of regular testing on academic performance. This is consistent with research by Brame and Biel (2017) and Braun and Sellers (2012), which highlight the benefits of frequent testing on students' academic performance and engagement. Their studies suggest that regular retrieval practice through quizzes strengthens memory and promotes long-term retention more effectively than traditional learning methods alone.

These results are further supported by Panadero (2018) and Adesope (2017), who also concluded that taking regular tests can improve academic performance. They found that formative assessments not only promote consistent learning habits, but also allow teachers to continually monitor student progress. This approach helps students avoid last-minute cramming, encourages continuous learning, and increases their chances of academic success. Additionally, studies suggest that using quizzes as assessment tools can increase student engagement. For example, teachers who awarded points for quiz performance observed significant improvements in both student achievement and participation. These results suggest that regular testing not only increases academic performance but also promotes an active, engaged learning environment in which students are more likely to succeed.

A significant percentage (78%) of students supported the integration of quizzes into each module. This is also consistent with Braun and Sellers (2012), who found that daily tests motivated

students to prepare for class, arrive on time, and actively participate. These student attitudes reflect the study's findings that consistent participation in quizzes helped students develop stronger study habits and engage more in class activities. Additionally, Braun and Sellers (2012) found that when structured as low-stakes tests, these tests do not overwhelm students but rather promote consistent preparation without high levels of anxiety.

Feedback from the tests encouraged active participation and 74.6% of students said the tests helped them learn more effectively. Most of them agreed that quizzes improved their skills and participation rates. According to Brame and Biel's discussion of cognitive psychology research, feedback, particularly on tests, improves memory and eliminates misunderstandings. Students are encouraged to review content through feedback, which is critical to correcting errors and improving learning. The combination of this feedback system with the frequent testing environment promotes participation and a deeper understanding of the topic (Brame & Biel, 2017).

6.0 CONCLUSION AND RECOMMENDATION

According to the study's findings, regular quizzes significantly improves students' academic performance and engagement in higher education. Compared to Group B students who did not take quizzes, Group A students who took quizzes often performed significantly better on tests and final exams. According to this result, regular quizzing improves learning through recall exercises, which strengthens memory and motivates continuous engagement with the learning material.

It is recommended that higher education institutions regularly integrate low-stakes testing into their courses to maximize the benefits mentioned. By helping students clear up misconceptions and increase their confidence in their knowledge, quick quiz feedback can further improve learning. Quizzes are also a useful tool for teachers to encourage active participation, which increases engagement and encourages regular study habits instead of cramming. By implementing these strategies, institutions can create an atmosphere that promotes academic achievement.

REFERENCES

Adesope, O. O., Trevisan, D. A., & Sundararajan, N. (2017). Rethinking the Use of Tests: A Meta-Analysis of Practice Testing. *Review of Educational Research*, *87*(3), 659–701.

https://doi.org/10.3102/0034654316689306

Black, P., & Wiliam, D. (2018). Classroom assessment and pedagogy. *Assessment in Education: Principles, Policy & Practice*, *25*(6), 551–575. https://doi.org/10.1080/0969594x.2018.1441807

Bognár, L., Fauszt, T., & Váraljai, M. (2021). The Impact of Online Quizzes on Student Success. *International Journal of Emerging Technologies in Learning (IJET)*, *16*(11), 225. https://doi.org/10.3991/ijet.v16i11.21679

Brame, C. J., & Biel, R. (2015). Test-Enhanced Learning: The Potential for Testing to Promote Greater Learning in Undergraduate Science Courses. *CBE—Life Sciences Education*, *14*(2), es4. https://doi.org/10.1187/cbe.14-11-0208

Braun, K. W., & Sellers, R. D. (2012). Using a "Daily Motivational Quiz" to Increase Student Preparation, Attendance, and Participation. *Issues in Accounting Education*, *27*(1), 267–279. https://doi.org/10.2308/iace-10219

Brown, T., Smith, J., & Adams, M. (2021). Adaptive quizzes and their role in student engagement in higher education mathematics courses. Journal of Computer-Assisted Learning, 37(3), 590-602.

Cook, B. R., & Babon, A. (2016). Active learning through online quizzes: Better learning and less (busy) work. *Journal of Geography in Higher Education*, *41*(1), 24–38. https://doi.org/10.1080/03098265.2016.1185772

Cheng, Y., Luo, Y., & Meng, F. (2019). Retrieval practice and mathematics learning: Evidence from university-level students. Learning and Instruction, 61, 68-75.

Fies, C., & Marshall, J. (2018). Formative assessment and its role in learning mathematics: A case for frequent quizzes. Journal of Educational Psychology, 110(5), 768-778.

Hidayat, N., & Irdiyansyah, I. (2023). Optimizing Academic Achievement through Comprehensive Integration of Formative Assessment into Teaching. *European Journal of Educational Research*, *12*(1), 71–85. https://doi.org/10.12973/eu-jer.12.1.71

Karpicke, J. D., & Blunt, J. R. (2011). Retrieval Practice Produces More Learning than Elaborative Studying with Concept Mapping. *Science*, *331*(6018), 772–775. https://doi.org/10.1126/science.1199327

Leeming, F. C. (2002). The Exam-A-Day Procedure Improves Performance in Psychology Classes. *Teaching of Psychology*, *29*(3), 210–212. https://doi.org/10.1207/s15328023top2903_06

Panadero, E., Andrade, H., & Brookhart, S. (2018). Fusing self-regulated learning and formative assessment: a roadmap of where we are, how we got here, and where we are going.

The Australian Educational Researcher, *45*(1), 13–31. https://doi.org/10.1007/s13384-018-0258-y

Patel, A., & Singh, R. (2023). Reducing math anxiety through frequent quizzing in higher education: An experimental approach. International Journal of Mathematical Education in Science and Technology, 54(7), 1105-1120.

Paas, F., & van Merriënboer, J. J. (2020). Cognitive-load theory: Methods to manage working memory load in the learning of complex tasks. *Current Directions in Psychological Science*, *29*(4), 394-398.

Pintrich, P. R. (1999). The role of motivation in promoting and sustaining self-regulated learning. *International journal of educational research*, *31*(6), 459-470.

Roediger, H. L., Agarwal, P. K., McDaniel, M. A., & McDermott, K. B. (2011). Test-enhanced learning in the classroom: Long-term improvements from quizzing. *Journal of Experimental Psychology: Applied*, *17*(4), 382–395. https://doi.org/10.1037/a0026252

Roediger, H. L., & Butler, A. C. (2011). The critical role of retrieval practice in long-term retention. *Trends in Cognitive Sciences*, *15*(1), 20–27. https://doi.org/10.1016/j.tics.2010.09.003

Saqware Francis, J. (2024). The Impact of Quizzes on Students' Class Attendance and Performance in Secondary School Mathematics Within Singida District. *The Journal of Informatics*, *4*(1). https://doi.org/10.59645/tji.v4i1.181.

Sweller, J. (2020). Cognitive load theory and educational technology. *Educational technology research and development*, *68*(1), 1-16.

Turner, J. C., & Patrick, H. (2004). Motivational Influences on Student Participation in Classroom Learning Activities. *Teachers College Record*, *106*(9), 1759–1785. https://doi.org/10.1111/j.1467-9620.2004.00404.x

van Gog, T., & Sweller, J. (2015). Not New, but Nearly Forgotten: the Testing Effect Decreases or even Disappears as the Complexity of Learning Materials Increases. *Educational Psychology Review*, *27*(2), 247–264. https://doi.org/10.1007/s10648-015-9310-x

Wilkinson, D. (2024). Formative Assessment Activities That Engage Students and Support Success. *Journal of Higher Education Theory and Practice*, *24*(1). https://doi.org/10.33423/jhetp.v24i1.6774

Xiao, Y., & Yang, M. (2019). Formative assessment and self-regulated learning: How formative assessment supports students' self-regulation in English language learning. *System*, *81*(1), 39–49.

Zimmerman, B. J. (1990). Self-Regulated Learning and Academic Achievement: An Overview. *Educational Psychologist*, *25*(1), 3–17. https://doi.org/10.1207/s15326985ep2501_2

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into Practice*, *41*(2), 64–70. https://doi.org/10.1207/s15430421tip4102_2