**STUDENTS DIGITAL READINESS AND INTEREST IN MATHEMATICS USING TEACHMINT PLATFORMS**

ABSTRACT

This research examined the digital readiness and interest levels of students taught Mathematics through the utilization of Teachmint Platforms (TP) in Port Harcourt City, Rivers State. The study employed a pre-test post-test quasi-experimental design, involving a sample of 124 students drawn from a larger population of 6,266 senior secondary school 2 Mathematics students (SS2) using purposive sampling methodologies. The research was driven by two specific research questions and two corresponding hypotheses. Descriptive statistics, including means and standard deviations, were utilized to address the research questions, whereas t-test and two-way ANCOVA were employed to evaluate the hypotheses at a significance level of p ≤ 0.05. Two assessment instruments were implemented in the study: the Mathematics Digital Readiness Assessment Scale (MDRAS), which exhibited a reliability coefficient of .936 determined through the test-retest method, and the Mathematics Interest Inventory (MII), which recorded a reliability coefficient of r = 0.85 ascertained via the Kuder Richardson Formula 20 (K-R 20) technique. The findings indicated that the Teachmint Platforms significantly enhanced students’ digital readiness and their interest in Mathematics. Consequently, it is advisable that the management of secondary schools in Rivers State consider the integration of Teachmint Platforms into the Mathematics curriculum, as it effectively engages and motivates students' interest, potentially leading to improved academic performance. The implications derived from the results underscore the necessity for further exploration of the Teachmint Platform, particularly acknowledging the existing scarcity of scholarly work in this area based on the reviewed literature.

**Key words:** Digital Readiness, Interest, Mathematics, Teachmint Platforms

Digital readiness refers to the mental and physical preparedness that enables individuals or groups to engage effectively in online learning (Reyes-Millan, Villareal-Rodriguez et al., 2023; Chen et al., 2024). The success of online education depends on learners’ resilience and capability to navigate digital platforms. Online learning, as described by Oguguo, Ocheni, and Adebayo (2021), involves using technology to deliver educational content, track progress, and provide feedback, an essential component in Mathematics education.

Mathematics fosters self-sufficiency, critical thinking, and problem-solving skills (Kravitz, 2013). However, maintaining student interest in Mathematics is crucial for effective learning. Interest, defined as focused attention driven by curiosity, encourages engagement in challenging subjects like Mathematics. Unfortunately, student enthusiasm for Mathematics is declining due to outdated teaching methods, ineffective instructional strategies, and a lack of real-world relevance (Chand, Chaudhary, & Prasad, 2021). This decline has contributed to poor academic performance in Nigeria (Zakaria, Dogo, & Kukwi, 2019).

Interest and academic achievements are interconnected since increased enthusiasm leads to better performance while lack of interest hampers learning. Engaged students are more likely to retain knowledge and participate actively. Okoro (2021) emphasized that innovative teaching methods can enhance student interest and performance. The growing shift to online education highlights the need to understand how students engage in virtual learning environments. Platforms like Teachmint can sustain student enthusiasm for Mathematics, ensuring effective learning. Anekwe (2007) as cited in Efiuvwere & Fomsi, 2019) identified four key motivational factors including relevance, confidence, attention, and satisfaction that, when incorporated into interactive digital learning, enhance meaningful educational experiences.

Teachmint, an online learning platform launched in 2018, has gained popularity, particularly in India, serving over 15 million users across 190 countries (Banerji, 2021). It is a cloud-based Learning Management System (LMS) that facilitates online teaching, lesson planning, and assessment while promoting analytical thinking, collaboration, and communication (Quinto, 2023). The platform is designed for easy access via smartphones, allowing educators to manage class activities effectively, automate attendance, and conduct assessments seamlessly (Yulianti & Wulandari, 2021).

Teachmint enhances digital learning by providing interactive features such as live polling and hand-raising, fostering student engagement. It simplifies instructional material management, organizes course content, tracks performance, and ensures timely feedback. The platform also encourages collaboration between teachers, students, and parents, creating an engaging learning environment (Quinto, 2023). Students have shown enthusiasm for Teachmint, finding it intuitive and motivating, particularly in science and mathematics, where it supports digital learning and academic success (Sulastiani, Sholih & Rusdiyani, 2023).

Nevertheless, Teachmint platform has some limitations which include the limited global presence since its operations are predominantly centred in India, the UAE, Indonesia, and Nigeria. Thus, in comparison to well-establised global competitors, Teachmint presents a reduced array of functionalities, which may diminish its competitive edge in the international marketplace.

At the same time, some of its strengths include the User-Friendly Interface which has been lauded by Educators for its intuitive architecture, which streamlines the execution of online classes and the management of administrative responsibilities. Furthermore, the platform is equipped with an array of instruments, such as live polling and hand-raising capabilities, designed to foster interactive educational environments.

In this regard, Subban, Soni, and Padayachee (2021) explored the readiness and satisfaction of students with online learning at the University of KwaZulu-Natal, South Africa. The study revealed that students were well-prepared for the digital learning experience, showcasing significant improvements in their readiness. Furthermore, Pagente, Selecios, Enriquez, Baterbonia, Casiple, and Rayos (2022) undertook a study on digital readiness for online education and the academic success of teacher education students during the COVID-19 pandemic. Their findings indicated that a substantial majority of the respondents demonstrated a high degree of readiness regarding their digital skills. Similarly, Oluwatumbi & Bernard (2022) looked into students’ preparedness for embracing digital technologies in the post-pandemic classrooms at Ekiti State University, Ado-Ekiti, Nigeria. It was revealed that students not only had access to digital technologies but also exhibited a strong willingness to transition from traditional face-to-face learning to virtual education. Consequently, this research delved into the realms of Connectivism theory and the Technology Integration Model (TIM) to explore the intricate relationships between the Teachmint Platform and the interest of senior secondary school students for Mathematics. These theoretical frameworks suggest that students find joy in the Mathematical lessons when they engage in social interactions, collaborating in groups, and partner with the teacher as a guide, thereby fostering the retention of knowledge they uncover themselves, bolstered by the teacher’s support (Sedig, 2008).

The utilization of digital platforms within the educational sector has fundamentally transformed the dynamics of teaching and learning. Teachmint, an educational platform recently introduced to educational institutions, offers a wide range of resources aimed at facilitating online educational delivery, management, and student interactive involvement. Whereas existing literature extensively explores the overall impact of digital platforms on academic achievement, there appears to be a scarcity of specific empirical data with respect to the effectiveness of Teachmint in relation to key variables such as student digital readiness and interest in the domain of Mathematics in the private senior secondary schools in Rivers State. This critical knowledge gap necessitated the present investigation focusing on comprehensive impact of Teachmint platform to optimise educational outcomes in Rivers State.

**Statement of the Problem**

The significance of Mathematics in shaping and sustaining a nation's development is undeniably profound. The reality is that individuals navigate daily challenges through the use of Mathematics, often without realizing it. The literature abounds with evidence that portrays Mathematics as a paradigm of reasoning and an essential instrument in both the sciences and the arts. Yet, the disheartening apathy towards Mathematics among senior secondary school students in Nigeria has emerged as a major issue for all educational stakeholders. Observations indicate that a teacher-centred approach has dominated Mathematics instruction in Nigeria for decades particularly in Rivers State, hence the focus of this study. Researchers suggest that this approach is a key barrier to effective Mathematics education.

 Fortunately, the recent upheaval caused by the Coronavirus (COVID-19) pandemic has transformed the world, altering our modes of living, working, and learning. The technological innovations of the 21st century have introduced a plethora of tools designed to enhance student learning and academic achievement. Yet, despite these advancements, the teacher-centred approach endures, with students exhibiting minimal interest for mathematics. This raises the question of whether alternative platforms might invigorate the study of Mathematics, hence the question, could the incorporation of the Teachmint platform spark a greater interest in Mathematics among students? Thus, this study aimed to explore the impact of the Teachmint platform on students’ digital readiness and their interest in Mathematics.

**Aim and Objectives of the Study**

This study sought to explore the influence of the Teachmint platform on students’ digital readiness and their interest in Mathematics within private senior secondary schools in Port Harcourt City.

Specifically, the study was intended to:

1. ascertain the pre-test post-test mean difference of students’ digital readiness using Teachmint.
2. examine the pre-test post-test mean difference of students’ interest in Mathematics using Teachmint platform.

**Research Questions**

The following research questions guided this study.

1. What is the pre-test post-test mean difference of students’ digital readiness in Mathematics using Teachmint platform?
2. What is the effectiveness of Teachmint platforms on students’ interest in Mathematics as measured by their mean scores?

 **Hypotheses**

The following null hypotheses stated at 0.05 level of significance guided the study.

1. There is no significant difference between the pre-test post-test mean scores of students’ digital readiness in Mathematics using Teachmint platform.
2. The pre-test post-test mean scores of students’ interest in Mathematics using Teachmint platform do not differ significantly.

**Study Area**

This research into students’ digital readiness and interest for mathematics through the Teachmint platforms took place in the vibrant urban landscape of Port Harcourt, nestled in Rivers State. Geographically, Port Harcourt is elegantly situated between 4º45′ N and 4º55′ N latitudes, and 6º55′ E and 7º05′ E longitudes. It lies approximately 25 km from the majestic Atlantic Ocean, cradled between the Dockyard Creek/Bonny River and the Amadi Creek. Once referred to as "Igwe-Ocha," this investigation concentrated specifically on the Port Harcourt LGA (PHLGA) and Obio-Akpor LGAs (OBALGA).

**Methodology**

The research employed a pre-test post-test quasi-experimental design that engaged a sample of 124 students drawn from a population of 6,266 Senior Secondary II Mathematics students (SS2), selected through a purposive sampling strategy. The chosen schools boasted nurturing environments, equipped with state-of-the-art ICT labs and abundant internet access. Participants were divided into two groups: the Teachmint platform Experimental group comprising 36 students and a control group of 40 students. The study utilized two key instruments: the Mathematics Digital Readiness Assessment Scale (MDRAS) with a reliability coefficient of .936 derived from a test-retest method and the Mathematics Interest Inventory (MII) with r = 0.85, calculated using the Kuder Richardson Formula 20 (K-R 20) technique.

The Mathematics Digital Readiness Assessment Scale (MDRAS) featured 20 items designed to gauge students' adeptness and readiness to engage with online learning platforms for their Mathematics studies. In parallel, the MII comprised 20 items aimed at assessing students' interest levels in Mathematics when instructed via the Teachmint Platform. The instruments were crafted using a modified Likert-type response scale, containing four distinct points. These tools were administered to all participating students on the initial day as a pre-test, followed by a post-test at the conclusion of the treatment. Rigorous face and content validation were performed on the instruments. Mean and standard deviation analyses were employed to address the research questions, while Hypotheses 1 and 2 were examined using independent samples t-test and 2-way ANCOVA.

**Results**

**Research question 1**: What is the pre-test post-test mean difference of students’ digital readiness in Mathematics using Teachmint platform?

**Table 1. Mean and standard deviation of the pre-test and post-test scores of students’ digital readiness in Mathematics using Teachmint platform.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Digital Readin (TP)** | **n** |  **Mean** |  **SD** |
| MDRAS Pretest (TP) | 36 |  7.89 |  2.69 |
| MDRAS Posttest (TP) | 36 |  14.64 |  1.99 |

Table 1. presents the mean and standard deviation for the effect of Teachmint platform on students’ digital readiness in Mathematic as measured by the difference in the pre-test and post-test mean scores. The analysis compares the pre-test and post-test mean scores for the digital readiness for the experimental group that was subjected to the use of Teahmint platform in the learning of Mathematics. Table1. shows that before the use of Teachmint platform, the students had a digital readiness pre-test mean score of 7.89 and a standard deviation of 2.69. After the intervention, the post-test mean score for the students in the experimental group that was exposed to Teachmint platform increased to 14.64 and a standard deviation of 1.99. Based on the obtained data, the result indicates that using Teachmint platform enhances students' digital readiness in Mathematics. The mean score improvement from 7.89 to 14.64 underscores the effectiveness of Teachmint platform in preparing students for a more technology-integrated Mathematics environment.

**Research question 2**: What is the effectiveness of Teachmint platforms on students’ interest in Mathematics as measured by their mean scores?

**Table 2. Mean and standard deviation on the effectiveness of Teachmint platforms on students’ interest in Mathematics as measured by their mean scores**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Treatment Group** | **n** | **Pre-test Mean** |  **SD** | **Post-test Mean** |  **SD** | **Mean Gain** |
| Teachm Exp Grp  | 36 | 63.3 | 8.02 | 67.06 | 6.07 | 3.75 |
| Control Group  | 40 | 38.90 | 5.76 | 43.50 | 5.82 | 4.60 |

Table 2. shows data on the interest towards Mathematics of an experimental group utilizing the Teachmint platform and a control group exposed to face-to-face method on their interest towards Mathematics. The experimental group, consisting of 36 students showed a pre-test mean score of 63.31 and a standard deviation of 8.021. After the intervention with the Teachmint platform, the post-test mean score rose to 67.06 with a reduced standard deviation of 6.07. This resulted in a mean gain of 3.75, indicating an increase in students' interest in Mathematics due to the use of the Teachmint platform.

In contrast, the control group, had a pre-test mean score of 38.90 with a standard deviation of 5.759. After the period of study without the Teachmint intervention, their post-test mean score increased to 43.50, with a slightly higher standard deviation of 5.82. This resulted in a mean gain of 4.60, showing an improvement in interest, though the absolute scores remained lower than those of the experimental group.

The mean gain in the control group, although slightly higher than that of the experimental group, suggests that while traditional methods can foster some increase in interest, the Teachmint platform improved much higher overall level of interest in mathematics among students. The experimental group’s higher post-test scores and lower standard deviation indicate a more consistent and effective enhancement of interest across the group compared to the control group.

**Hypothesis 1**: There is no significant difference between the pre-test post-test mean scores of students’ digital readiness in Mathematics using Teachmint platform.

**Table 3. Paired t-test on students’ digital readiness in Mathematics using Teachmint platform**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Digital Read (Teachmint)** | **Mean**  |  **SD** |  | **n** | **df** |  | **t Sig** |
| MDRAS Pre-test  | 7.89 |  2.69 |  | 36 | 35 | 25.43 | .000 |  |
| MDRAS Post-test  | 14.64 |  1.98 |  |

Table 3. shows the independent paired samples t-test analysis conducted to determine if there was a significant difference in the pre-test post-test mean scores of students’ digital readiness in Mathematics using Teachmint platform. The t-value is computed as 25.43, with a degree of freedom (df) of 35. The significance value (Sig.) is reported as .000. Based on the results of the t-test, the null hypothesis of no significant difference in the pre-test post-test mean scores of students’ digital readiness in Mathematics using Teachmint platform is rejected and the alternative accepted. Thus, there is a significant effect of Teachmint platform on the digital readiness of students, as indicated by the significant improvement in the pre-test and post-test scores in the experimental group. Therefore, Teachmint digital platform is significantly effective in making students ready for a more digital-integrated Mathematics environment.

**Hypothesis 2**: The pre-test post-test mean scores of students’ interest in Mathematics using Teachmint platform do not differ significantly.

**Table 4. Summary of 2-way ANCOVA of the effect of Teachmint platforms on students’ interest in Mathematics.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Source** |  | **Type III Sum** **of Squares** | **Df** | **Mean Square** |  **F** | **Sig.** | **Partial Eta Squared** |
| Corrected Model |  | 12978.56 a | 2 | 6489.28 | 1105.41 | .000 | .968 |
| Intercept |  | 213.85 | 1 | 213.85 | 36.43 | .000 | .333 |
| Interest |  | 2465.35 | 1 | 2465.35 | 419.96 | .000 | .852 |
| Groups |  | 46.49 | 1 | 46.49 | 7.92 | .006 | .098 |
| Error |  | 428.54 | 73 | 5.87 |  |  |  |
| Total |  | 240456.00 | 76 |  |  |  |  |
| Corrected Total |  | 13407.11 | 75 |  |  |  |  |

 Table, 4. reveals the significant effect of Teachmint platform on the interest of student towards Mathematics as measured by the difference in the mean scores of students in the groups (experimental group and control group). The table shows that the computed F (2, 85) = 7.92 P <.05, i.e. p = .006 is statistically significant at the chosen alpha level of 0.05. Therefore, there is a significant effect of Teachmint platform on students’ interest in Mathematics, as indicated by the significant improvement in scores in the experimental group compared to the control group as F (2, 85) = 7.92 P <.05, i.e. p = .006. Therefore, the null hypothesis of no significant effect of Teachmint platform on students’ interest in Mathematics is rejected and the alternate accepted. This implies that the difference that exists between experimental group (those exposed to Teachmint platform) mean scores and the control group (which did not receive exposure to Teachmint platform intervention) statistically is significant. Furthermore, the partial eta square which shows the effect size of the independent variable on the dependent variable shows a partial eta square of .098. This partial eta squared value of .098 suggests also an effect of Teachmint platform on the interest of student towards Mathematics. Therefore, Teachmint platform has statistically significant effect on the interest of students towards Mathematics.

Discussion of Findings

The revelations from this study indicated that the Teachmint platform significantly amplified students' digital readiness and interest for Mathematics. The outcome of the diminished pre-test scores was not unexpected, as the Teachmint platform was relatively novel to the students' academic experience. Consequently, this underscores the Teachmint platform's capacity in equipping students for a more technologically enriched Mathematics landscape, confirming the findings of Subban, Soni, and Padayachee (2021), who explored students' readiness and contentment with online learning at the University of KwaZulu-Natal, South Africa, where learners were well-prepared for online education and exhibited growth in readiness. Kurniawan and Fitria (2023) executed a study on the application of e-Learning through the flipped classroom model via the Teachmint application, analysing its repercussions on students’ scientific learning outcomes. The validation and assessment of science lessons revealed that the e-Learning tools, rooted in the Flipped Classroom Model and leveraging the Teachmint application for Ecosystem studies, were remarkably valid and effective, achieving high scores in practical endeavours. From the gathered insights, it was deduced that the integration of the Teachmint application in e-Learning markedly propelled valid, practical, and efficacious science learning results in elementary institutions. This could likely be linked to students' intrinsic interest in the Teachmint platform during their Mathematics lessons, which aligns with Danial's (2022) inquiry into student academic success through the Teachmint platform. Danial (2022) attributed this achievement to an upsurge in students' interest for learning via the Teachmint platform. Thus, the Teachmint platform does not only bolster students’ digital readiness in Mathematics but also showcases a statistically significant enhancement of students’ interest in the subject.

Conclusions

The findings of this research have clearly illuminated the potential of an innovative approach to teaching Mathematics in senior secondary schools and are in agreement with the findings of Subban, Soni, and Padayachee (2021), (Sulastiani, Sholih and Rusdiyani, 2023) which therefore, has filled the existing gap.

 The insights gleaned from this study could inspire educators to adopt alternative methodologies intertwined with technology in their classrooms, catering to diverse learning preferences, unveiling various teaching techniques, offering students additional opportunities for one-on-one collaboration with their instructors, and fostering meaningful dialogues among peers. The benefits of leveraging Teachmint platforms have been demonstrated to elevate teacher efficacy, thereby positively influencing students’ digital readiness and passion for Mathematics in senior secondary education.

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Recommendations

In light of the findings, the following suggestions are proposed:

Both public and private educational institutions should be adequately outfitted with modern technological devices and essential infrastructure in senior secondary schools to enable the integration of ICT in the teaching and learning of Mathematics. Rivers State schools should contemplate the adoption of Teachmint platforms for Mathematics, as they effectively engage and invigorate students’ enthusiasm for the subject. Further investigations into the Teachmint platform are warranted to substantiate its specific influence on student interest.

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