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

ABSTRACT

This research examined the digital readiness and interest levels of students in 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 Platform 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

**Introduction**

Digital readiness embodies the mental and physical state of being that empowers an individual or collective to dive into the realm of online learning experiences (Reyes-Millan, Villareal-Rodriguez et al 2023, Chen et al 2024). This notion suggests that the triumph of online education significantly hinges on the mental and physical fortitude of a person or group as they embark on such journeys. Online learning, as characterized by Oguguo, Ocheni, and Adebayo (2021), is the art of leveraging technology to deliver educational and training content in a digital format, monitor learners’ performances, and offer constructive feedback on their academic journeys. Such feedback is crucial in the educational voyage of Mathematics.

Mathematics, as a discipline, ignites self-sufficiency and provides learners with the tools to think critically and tackle their challenges with confidence (Kravitz, 2013). To illustrate, when delving into Geometry, it fosters logical reasoning within individuals, equipping them with the skills to gauge distances and materials effectively. In this manner, students cultivate the habit of analytical thinking, enabling them to forge connections between the familiar and the aspirational. Nevertheless, it is essential for students to nurture an interest in Mathematics to enhance its significance.

Interest can be articulated as the act of channelling one's sensory focus towards a specific person, activity, circumstance, or object. It is an expression of one’s experiences, coupled with a sense of curiosity. This curiosity often drives an individual to engage in particular challenges or tasks, such as those encountered in Mathematics classes. Unfortunately, student interest in Mathematics is on the decline. This downturn can be traced back to certain educators' inability to engage all students in instructional activities and to employ effective teaching strategies. Additionally, the repetitive instruction of skills and practices that fail to resonate with the demands of the 21st-century workplace renders the subject less appealing to students. Chand, Chaudhary, and Prasad (2021) noted that the reluctance of students to delve into Mathematics stems from out-dated teaching methods that overlook modern technologies and a general lack of enthusiasm for the quantitative application of Mathematical principles. Consequently, there is a troubling trend of inadequate academic performance among students in Nigeria, as highlighted by Zakaria, Dogo, and Kukwi (2019). Interest embodies a sense of curiosity, which typically motivates individuals to tackle specific challenges or tasks. Interest is intertwined with psychological motivation, propelling someone to excel in their endeavours.

Furthermore, the threads of interest and accomplishment are woven together in the intricate tapestry of teaching and learning, each one casting its influence upon the other. An elevated passion for learning propels students toward success, while notable achievements kindle the flames of curiosity. In contrast, a lack of interest acts as an anchor, dragging down the sails of learning and resulting in diminished achievements. Conversely, Abakpa and Iji (2011) characterize interest as a persistent attribute, emerging from the bond between an individual and a particular activity or object. The enthusiasm displayed by students in a subject area serves as a crystal ball, forecasting their engagement levels and depth of understanding, along with their ability to recall information. Within the realm of education, interest manifests as an amplified awareness and concentration on classroom endeavours and scholarly pursuits. He pointed out that the depth of learning hinges on the amount of time a child immerses themselves in the process of discovery. The hours committed to studying fortify students' retention of learned materials, which may ultimately elevate their performance during assessments and examinations.

Okoro (2021) highlighted that the interests and achievements of students can be shaped by inventive teaching strategies. The notion of students' interest in the domain of online learning has earned increasing scholarly focus in recent years, as the landscape of online education rapidly expands. In the realm of online learning, delving into and grasping student interest acquires additional layers, given that the learning atmosphere and content delivery diverge significantly from traditional in-person instruction. It’s vital to acknowledge that the enthusiasm cultivated in students while studying Mathematics on the Teachmint platform can be nurtured and may lead to fruitful Mathematical learning. However, if a learner's interest wanes during any activity, the essence of learning is lost. This underscores why Anekwe (2007) delineated four essential conditions to inspire students to learn: these encompass relevance, confidence, attention, and satisfaction; when these elements are harmoniously integrated into the teaching of Mathematics using an interactive platform like Teachmint, meaningful learning can unfold.

The Teachmint platform is a fresh online tool, having emerged in 2018, and it swiftly captured the hearts of schools across India and beyond, now catering to over 15 million users in 190 nations (Banerji, 2021). The platform's effectiveness has yet to gain widespread recognition. Teachmint serves as a straightforward multimedia learning resource, adept at presenting lesson material and compatible with all smartphone operating systems. It equips both students and educators with valuable tools to seamlessly engage in online activities from anywhere, at any time (Quinto, 2023). This platform is a complimentary, cloud-based Learning Management System (LMS). Teachmint is crafted as a digital educational hub aimed at educational institutions, designed to streamline the virtual generation, dissemination, and evaluation of academic endeavours. This platform acts as an e-learning tool that nurtures the growth of analytical thinking, collaboration, and interpersonal communication among students and teachers during the educational journey. Moreover, it can be effortlessly accessed through smartphones by both educators and learners (Danial, 2022; Khulaifiyah et al., 2023).

Through the enchanting realm of Teachmint, educators can effortlessly meet the digital learning aspirations of their pupils, equipping teachers with the prowess to deftly orchestrate an array of class activities, such as leading face-to-face sessions, archiving and safeguarding educational materials, curating and disseminating learning treasures, and even gearing up for lessons within mere moments. Moreover, Teachmint gracefully automates attendance while enabling the swift creation and evaluation of exams in the blink of an eye (Yulianti & Wulandari, 2021). Indeed, the hybrid learning framework inspired by Teachmint champions flexibility and ease for both educators and learners, paving the way for tailored learning journeys and heightened engagement. It empowers educational institutions to refine their operations and elevate the teaching-learning experience.

Teachmint transforms the process of accessing and employing instructional materials for lesson delivery into a seamless experience. Additionally, it facilitates the organization of course content, meticulous tracking of performance, and accurate grading of students. One of the standout features of this e-learning marvel is the remarkable accessibility to teaching and learning resources, simplified file management, instantaneous access to educational materials, and prompt feedback on online assessments. The platform is meticulously crafted to amplify learning outcomes and effortlessly enhance the online teaching voyage. Quinto (2023) highlighted that integrating Teachmint within the classroom nurtures collaboration and communication among teachers, students, and parents, cultivating a vibrant and interactive educational atmosphere. Furthermore, the platform elevates the accessibility for students in submitting their work, engaging in the learning adventure, and retrieving educational resources.

Moreover, students have expressed delightful enthusiasm towards the Teachmint application, finding it both enjoyable and intuitive, which can spark motivation and allure towards scientific subjects. The Teachmint platform has proven to be instrumental in boosting students’ academic accomplishments (Sulastiani, Sholih & Rusdiyani, 2023). This platform serves as a powerful ally in preparing students for a Mathematically enriched technological landscape, particularly when the learners are digitally equipped.

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 & Benard (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 delves into the realms of Connectivism theory and the Technology Integration Model (TIM) to illuminate 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 journey when they engage in social interactions, collaborate 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).

**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 lens of Mathematics, often without realizing it. The literature is replete 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 pressing issue for all educational stakeholders. Observations indicate that a teacher-cantered approach has dominated the Mathematics instruction in Nigeria, particularly in Rivers State, the focus of this study. Researchers suggest that this approach is a key barrier to effective Mathematics education.

Nevertheless, 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-cantered approach endures, with students exhibiting minimal interest for mathematics. This raises the question of whether alternative platforms might invigorate the study of Mathematics. Could the incorporation of the Teachmint platform spark a greater interest in Mathematics among students? Thus, this study aims 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 seeks 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 is 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 of this study illuminated 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 fresh to the students' academic experience. Consequently, this underscores the Teachmint platform's prowess in equipping students for a more technologically enriched Mathematics landscape, echoing 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 Techmint platform during their Mathematics journey, which aligns with Danial's (2022) inquiry into student academic success through the Teachmint platform, discovering that educational accomplishments flourished when paired with specific learning strategies alongside the Teachmint Application, attributing this to an upsurge in students' enthusiasm for learning via the Teachmint platform. Thus, the Teachmint platform not only bolstered students’ digital readiness in Mathematics but also showcased a statistically significant enhancement of students’ interest in the subject.

Conclusions

The findings of this research have illuminated the promise of an innovative approach to teaching Mathematics in senior secondary schools. 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.

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.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

**References**

Abakpa, B. O., & Iji, C. O. (2011). Effect of mastery learning approach on senior secondary school students’ achievement in geometry. *Journal of Science Teachers Association of Nigeria, 8(2), 24-31.*

Anekwe, J. U. (2007). *Effects of constructions based-model on students‟ interest and academic achievement of French language students in Anambra State Secondary School.* Ph.D Dissertation, (University of Port Harcourt), Rivers State.

Banerji, O. (2021). Teachmint, Classplus draw a post-pandemic map for B2B edtech

Chand, S., Chaudhary, K., Prasad, A. & Chand, V. (2021). Perceived causes of students’ poor performance in mathematics: A case study at Ba and Tavua secondary schools. *Frontiers in Applied Mathematics and Statistics*, *7*, 614408.

Coopasami, M., Knight, S. & Pete, M. (2017). E-Learning readiness amongst nursing students at the Durban University of Technology. *Health SA Gesondheid.* 22, 300-306.

Google (2017). *About classroom*. <https://support>. google.com/edu/classroom/answer/602029?hi=en

Danial, M. (2022). Peningkatan Hasil Belajar Siswa Dalam Mengunkapkan Expression Of Sympathy Melalui Model Pmpdr Dan Aplikasi Teachmint. *Action : Jurnal Inovasi Penelitian Tindakan Kelas Dan Sekolah*, *2*(3), 313-324. <https://doi.org/10.51878/action.v2i3.1441>

Khulaifiyah, Sri Yuliani, Aulia Azzahra Fara (2023) Linkage of Students’ Synchronous and Autonomous Learning at the Tertiary Level. *Al-Ishlah: Jurnal Pendidikan
Vol.15, 2, pp. 1246-1256*ISSN: 2087-9490 EISSN: 2597-940X, DOI: 10.35445/alishlah.v15i2.3316
<http://journal.staihubbulwathan.id/index.php/alishlah>

Kravitz, C. (2013). *Why math is important*. [www.slideshare.net/chelseakravitz/why-](http://www.slideshare.net/chelseakravitz/why-math-is-important)math- [is-important](http://www.slideshare.net/chelseakravitz/why-math-is-important).

Kurniawan, R & Fitria (2023) E-Learning Using the Flipped Classroom Model-Based E-Learning Using the Flipped Classroom Model-Based Learning Outcomes *International Journal of Elementary Education Volume 7, Number 3, Tahun 2023, pp. 485-495* P-ISSN: 2579-7158 E-ISSN: 2549-6050 <https://doi.org/10.23887/ijee.v7i3.59262>

Oguguo, B. C. E, Ocheni, A. O. & Adebayo, F. K. (2021). Students’ achievement in online test and measurement course in synchronous and asynchronous e-learning platform. *European Journal of Open Education and E-learning Studies, 6*(2), 137-151. https://doi.org/10.46827/ejoe.v6i2.3966 [www.oapub.org/edu](http://www.oapub.org/edu).

Okoro, A. U. (2021). Comparative Effect of Three Innovative Instructional Strategies on Academic Achievement of Students in Biology. *Journal Of Critical Reviews, 8(3), 123-130.*

Oluwatumbi, O. S., & Benard, A. A. (2022). Post Pandemic Classroom and Students’ Readiness for the Utilisation of Digital Technologies in Ekiti State University, Nigeria. *The International Journal of Science & Technoledge*, *10*(3). https://doi.org/10.24940/theijst/2022/v10/i3/ST2202-012

Pagente, Selecios, Enriquez, Baterbonia, Casiple, and Rayos (2022)

Quinto, R. M. (2023). TEACHMINT application: A learning management system to accessibility and performance in information and communication technology (ICT). Laguna State Polytechnic University.

Reyes-Mill ́an, M., Villareal-Rodríguez, M., Murrieta-Flores, M.E., Bedolla-Cornejo, L., V ́azquez-Villegas, P. & Membrillo-Hern ́andez, J. (2023). Evaluation of online learning readiness in the new distance learning normality. *Journal of Distance Education Policy and Practice, 41*(2), 89-105. <https://doi.org/10.1080/01587919.2022.2117956>

Sedig, K. (2008). From play to thoughtful learning: A design strategy to engage children with mathematical representations. *Journal of Computers in Mathematics and Science Teaching*, 27(1), 65-101.

Subban, M., Soni, S. & Padayachee, I. (2021). Students’ digital readiness for – and satisfaction with – online learning: A case study of the University of KwaZulu-Natal, South Africa. Progressio, 42, 25 pages. <https://doi.org/10.25159/2663-5895/10299>

Sulastiani, Y., Sholih, S. & Rusdiyani, I. (2023). Development of online-based interactive video media using TEACHMINT application for natural science learning. *Prisma Sains : Jurnal Pengkajian Ilmu dan Pembelajaran Matematika dan IPA IKIP Mataram, 11*(3), 890-898. doi:https://doi.org/10.33394/j-ps.v11i3.7180 <https://doi.org/10.33394/j-ps.v11i3.7180>

Widodo, A., Nursaptini, N., Novitasari, S., Sutisna, D. & Umar, U. (2020). From face-to-face learning to web base learning: How are student readiness. *Premiere Educandum: Jurnal Pendidikan Dasar Dan Pembelajaran*, *10*(2), 149-160.

Yulianti, Y. A., & Wulandari, D. (2021). *Flipped Classroom: Model Pembelajaran Untuk Mencapai Kecakapan Abad 21 Sesuai Kurikulum 2013 (Vol. 7, Issue 2).* Jurnal Hasil Penelitian Dan Kajian Kepustakaan Di Bidang Pendidikan, Pengajaran Dan Pembelajaran. <https://doi.org/10.33394/jk.v7i2.3209>. DOI: <https://doi.org/10.33394/jk.v7i2.3209>

Zakaria, N., Dogo, E. D. & Kukwi, C. A. (2019). Trend analysis of student’s performance in mathematics at credit level in West African senior secondary certificate examination from 2011-2018 in view of vision 20:2020 and beyond. *International Journal of Research 6(10), 250-260.*