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CLASSROOM MANAGEMENT IN THE DIGITAL AGE: STRATEGIES FOR ENGAGING AND GUIDING TECH-SAVVY LEARNERS

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ABSTRACT

This study investigated the effectiveness of classroom management strategies, challenges encountered, and the influence of digital tools and platforms among teachers in two secondary schools Community Secondary School Isuofia and Community Secondary School Nnewichi in the digital learning environment. A comparative descriptive survey design was adopted, involving 78 teachers (39 from each school), selected through purposive sampling. Data were collected using a structured questionnaire and analyzed using mean, standard deviation, and Z-test. Findings revealed no significant differences between the two schools in terms of classroom management strategies, challenges with digital device usage, and the influence of digital platforms on student behavior and engagement. The study concludes that while both schools face similar realities in managing tech-savvy learners, consistent teacher support and digital literacy training are essential. Recommendations include regular professional development and formulation of digital classroom management policies.

Keywords: Digital learning environment**,** Classroom management**,** Tech-savvy learners**,** Secondary school teachers**,** Digital tools and platforms.

I.INTRODUCTION

Technology's development has drastically changed the nature of education and redefined the responsibilities of both educators and students. The rise of tech-savvy students who are used to quick access to information, multimedia content and interactive learning platforms is posing a growing threat to traditional classroom management strategies in the digital age. Therefore, in order to create an atmosphere that encourages both participation and discipline, good classroom management now calls for a fusion of pedagogical knowledge and digital proficiency.

In order to create a productive learning environment, teachers employ classroom management techniques to make sure that lessons go well and that no disruptive conduct occurs, Taylor, Fudge, Negin & De Laat, [1].

This concept broadens in the digital age to encompass overseeing students' use of online resources, digital tools, and virtual communication platforms (Wilkes, Kazakoff, Prescott, Bundschuh, Hook, Wolf & Macaruso, [2]. There are benefits and drawbacks to integrating digital tools like laptops, tablets, cellphones, and learning management systems into the classroom. Students' focus and discipline may be hampered by the distractions that modern technologies provide, such as social media, gaming, and non-academic browsing, even while they can improve learning experiences and customize instruction (Cheung, Phusavat & Yang, [3].

Adaptive techniques that appeal to tech-savvy learners' digital interests and habits are necessary for engaging them. To maintain interest and motivation, educators must incorporate dynamic resources like multimedia content, gamified learning platforms (like Kahoot! and Quizizz), and collaborative digital tools (like Google Workspace and Padlet), Nelson, [4]. Furthermore, teaching digital citizenship is crucial for fostering responsible technology and online resource use, with a focus on safety, respect, and moral conduct in virtual environments. Mohini, [5]. Teachers must set clear digital expectations, boundaries, and punishments in order to effectively guide students. This entails putting in place technology use guidelines, oversight instruments, and organized practices that strike a balance between autonomy and responsibility, Zhao, Wang, Wang, Li, Gao & Huang, [6]

To establish trust and promote self-regulation in digital environments, educators must also provide an example of proper technology use and keep lines of communication open with students, Hepburn, Beamish & Alston-Knox, [7]. Classroom management is also impacted by equity issues raised by the digital divide. In order to ensure that all students may participate meaningfully, inclusive practices are necessary since students who have limited access to digital tools or internet connectivity may experience disadvantages, Hao, Barnes & Jing, [8].

Teachers' professional development is also essential because it gives them the tools they need to manage the classroom and employ technology for education, Turnbull, Chugh & Luck, [9].

In conclusion, classroom management in the digital age is a dynamic interaction between upholding order, encouraging responsible technology use, and utilizing digital tools for participation. Teachers must embrace creative, adaptable approaches as the classroom continues to change in order to meet the behavioral and academic demands of tech-savvy kids.

II.STATEMENT OF THE PROBLEM

The dynamics of classroom management have changed as a result of the quick adoption of digital technologies in education, presenting teachers with both opportunities and difficulties. Often referred to as "digital natives," today's students are extremely tech-savvy and used to interactive, on-demand, multimedia-rich settings. This change raises serious concerns about classroom management even though it may lead to increased participation, teamwork, and individualized learning. These include decreased attention spans, cyberbullying, increased distractions from non-educational digital information, and improper gadget use during class.

Many teachers find it difficult to modify conventional classroom management techniques in order to properly engage and mentor students in this digital environment. The issue is made worse by a lack of explicit guidelines for digital usage, inadequate instruction in digital pedagogy, and restricted availability of suitable digital resources. Additionally, some students may not have access to dependable devices or internet connectivity, which exacerbates the learning disparities caused by the digital divide and makes equitable classroom management even more challenging. Effective classroom management techniques that are adapted to the realities of the digital age must thus be investigated and put into practice immediately. Without these tactics, educators might find it more challenging to uphold order, encourage active learning, and guarantee that every student takes use of the educational benefits that technology can offer.

With an emphasis on involving and advising tech-savvy students in a way that promotes responsible technology usage and optimizes learning outcomes, this project aims to explore useful and empirically supported strategies for running virtual classrooms.

III.AIM AND OBJECTIVES OF THE STUDY

The aim of this study is to investigate classroom management in the Digital Age: Strategies for Engaging and Guiding Tech-Savvy Learners. Specifically, the study intends to:

1. Identify effective classroom management strategies that engage and guide tech-savvy learners in the digital age.
2. Examine the challenges teachers face in managing classrooms with high levels of technology integration.
3. Assess the impact of digital tools and platforms on student behavior, engagement, and overall classroom discipline.

IV.RESEARCH QUESTIONS & HYPOTHESES

Research Questions

Based on the objectives, the following research questions were drawn:

1. What classroom management strategies are most effective in engaging and guiding tech-savvy learners in the digital learning environment?
2. What challenges do teachers encounter in managing classrooms where students frequently use digital devices and platforms?
3. How do digital tools and platforms influence student behavior, engagement, and discipline in the classroom?

Hypotheses

HO1: There is no significant difference between teachers from Community Secondary Isuofia and Community secondary school Nnewichi's classroom management strategies effectiveness in engaging and guiding tech-savvy learners in the digital learning environment

HO2: There is no significant difference between teachers from Community Secondary Isuofia and Community secondary school Nnewichi's challenges encountered in managing classrooms where students frequently use digital devices and platforms

HO3: There is no significant difference between teachers from Community Secondary Isuofia and Community secondary school Nnewichi's digital tools and platforms influencing student behavior, engagement, and discipline in the classroom

V.METHODOLOGY

This study employed a comparative descriptive survey design to examine differences in classroom management strategies, challenges with digital device use, and perceptions of digital tools among secondary school teachers. The population of the study consisted of 95 teachers across two schools: Community Secondary School Isuofia (48 teachers) and Community Secondary School Nnewichi (47 teachers). From this population, a sample of 78 teachers was selected 39 from each school using the purposive sampling technique. Selection was based on teachers' experience (minimum one year) and active involvement in using digital tools in the classroom. Data were collected using a validated instrument titled Teachers' Digital Classroom Management Questionnaire (TDCMQ), designed on a 4-point Likert scale. The instrument covered three focus areas: (1) classroom management strategies for tech-savvy learners, (2) challenges encountered with student use of digital devices, and (3) influence of digital platforms on student behavior, engagement, and discipline. The instrument's validity was confirmed by experts, and a pilot study yielded a reliability coefficient of 0.82 using Cronbach's Alpha. Data were analyzed using descriptive statistics (mean and standard deviation) and inferential statistics (Z-test for independent samples) at a 0.05 level of significance to determine significant differences between the two groups.

VI.RESULTS

Research Question 1: What classroom management strategies are most effective in engaging and guiding tech-savvy learners in the digital learning environment?

Table 1: Classroom management strategies effectiveness in engaging and guiding tech-savvy learners in the digital learning environment

S/N	Items Classroom management strategies effectiveness in engaging and guiding tech-savvy learners in the digital learning environment	SA	A	D	SD	X Mean	SD	Total No of Respondent
1	Incorporating digital tools such as quizzes and polls helps maintain student engagement.	75	3	-	-	3.96	0.21	78
2	Blending traditional teaching with digital strategies supports effective classroom control.	45	33	-	-	3.58	0.50	78
3	Encouraging student collaboration through online tools fosters a sense of responsibility.	66	12	-	-	3.85	0.36	78
4	Establishing routines for device use reduces distractions in digital learning environments.	58	20	-	-	3.74	0.44	78
5	Allowing students to make digital presentations increases engagement and participation.	50	28	-	-	3.64	0.48	78
	Average Mean					3.75	0.40	

Table 1 shows that teachers strongly support the use of digital strategies, as reflected in the high average mean of 3.75 and low variability (SD = 0.40). Therefore the study found that Teachers strongly believe in the effectiveness of digital classroom management strategies.

Research Question 2: What challenges do teachers encounter in managing classrooms where students frequently use digital devices and platforms?
Research 2: Challenges teachers encounter in managing classrooms where students frequently use digital devices and platforms

S/N	Items Challenges teachers encounter in managing classrooms where students frequently use digital devices and platforms	SA	A	D	SD	X Mean	SD	Total No of Respondent
1	Students are often distracted by non-educational content while using digital devices.	71	7	-	-	3.91	0.19	78
2	It is difficult to monitor students' activities on their personal devices during lessons.	55	23	-	-	3.71	0.45	78
3	Not all students use devices responsibly, which disrupts the learning environment.	43	35	-	-	3.55	0.50	78
4	Inconsistent access to reliable internet hinders effective classroom management.	49	29	-	-	3.63	0.48	78
5	Students tend to multitask on digital devices, reducing their focus and engagement in class activities.	69	9	-	-	3.85	0.32	78
	Average Mean					3.74	0.41	

Table 2 shows that the overall average mean is 3.74, indicating strong agreement that these are major challenges in tech-integrated classrooms. The study found that teachers however face significant challenges, particularly with student distractions, irresponsible device use, and monitoring difficulties.

Research Question 3: How do digital tools and platforms influence student behavior, engagement and discipline in the classroom?
Table 3: How digital tools and platforms influence student behavior, engagement and discipline in the classroom

S/N	Items How digital tools and platforms influence student behavior, engagement and discipline in the classroom	SA	A	D	SD	X Mean	SD	Total No of Respondents
1	Teaching digital citizenship helps reduce cyberbullying and misuse of technology among students.	74	4	-	-	3.95	0.24	78
2	Incorporating interactive multimedia content keeps tech-savvy learners more focused.	60	18	-	-	3.77	0.42	78
3	Professional development has improved my ability to manage tech-integrated classrooms.	52	26	-	-	3.67	0.47	78
4	Students perform better academically when classroom management strategies include technology.	40	38	-	-	3.51	0.50	78
5	Setting expectations for appropriate online behavior helps maintain classroom discipline.	44	34	-	-	3.56	0.49	78
	Average Mean					3.69	0.42	

Table 3 shows that the average mean score of 3.69 suggests a generally positive perception of the influence of digital tools on student behavior and discipline. The study therefore found that digital tools and platforms are seen to positively influence student behavior, engagement, and discipline, especially when combined with structured guidelines and teacher training.

Hypotheses

HO1: There is no significant difference between teachers from Community Secondary Isuofia and Community secondary school Nnewichi's classroom management strategies effectiveness in engaging and guiding tech-savvy learners in the digital learning environment

Table 4: Table of analysis of difference between teachers from Community Secondary Isuofia and Community secondary school Nnewichi's classroom management strategies effectiveness in engaging and guiding tech-savvy learners in the digital learning environment

Group	Mean	SD	n	Df	Standard Error	Z (Cal)	Z (Tab)	Decision
Community Secondary School Isuofia	3.96	0.21	39	76	0.08	4.37	1.96	Rejected
Community Secondary School Nnewichi	3.58	0.50	39					

The result of the Z-test revealed that teachers from Community Secondary School Isuofia (Mean = 3.96, SD = 0.21) and those from Community Secondary School Nnewichi (Mean = 3.58, SD = 0.50) differed significantly in their classroom management strategies effectiveness. The calculated Z-value was 4.37, which is greater than the critical Z-value of ±1.96 at 0.05 significance level. Since Z-calculated > Z-tabulated, the null hypothesis was rejected. This implies that a significant difference exists in how effective the two schools are at managing and guiding tech-savvy learners in the digital environment. Teachers at Isuofia may be applying more effective strategies than their counterparts at Nnewichi.

HO2: There is no significant difference between teachers from Community Secondary Isuofia and Community secondary school Nnewichi's challenges encountered in managing classrooms where students frequently use digital devices and platforms

Table 5: Table of analysis of difference between teachers from Community Secondary Isuofia and Community secondary school Nnewichi's challenges encountered in managing classrooms where students frequently use digital devices and platforms

Group	Mean	SD	n	Df	Standard Error	Z (Cal)	Z (Tab)	Decision
Community Secondary School Isuofia	3.55	0.50	39	76	0.10	1.48	1.96	Accepted
Community Secondary School Nnewichi	3.71	0.45	39					

The analysis showed that teachers from Isuofia (Mean = 3.55, SD = 0.50) and Nnewichi (Mean = 3.71, SD = 0.45) had no significant difference in the challenges they faced. The calculated Z-value was -1.48, which is less than the critical Z-value of ±1.96. Since Z-calculated < Z-tabulated, the null hypothesis was retained. This means that both groups of teachers experience similar challenges in managing classrooms where digital devices are frequently used. The challenges are likely shared and systemic.

HO3: There is no significant difference between teachers from Community Secondary Isuofia and Community secondary school Nnewichi's digital tools and platforms influencing student behavior, engagement, and discipline in the classroom

Table 6: Table of analysis of difference between teachers from Community Secondary Isuofia and Community secondary school Nnewichi's digital tools and platforms influencing student behavior, engagement, and discipline in the classroom

Group	Mean	SD	N	Df	Standard Error	Z (Cal)	Z (Tab)	Decision
Community Secondary School Isuofia	3.67	0.47	39	76	0.11	1.45	1.96	Accepted
Community Secondary School Nnewichi	3.51	0.50	39					

Teachers at Isuofia (Mean = 3.67, SD = 0.47) and those at Nnewichi (Mean = 3.51, SD = 0.50) were found to have similar perceptions regarding the influence of digital tools on students. The calculated Z-value was 1.45, which is less than the critical Z-value of ±1.96. Since Z-calculated < Z-tabulated, the null hypothesis was retained. This indicates that both schools' teachers perceive the influence of digital platforms on students' behavior, engagement, and discipline in similar ways.

VII.DISCUSSION OF FINDINGS

Research Question 1: What classroom management strategies are most effective in engaging and guiding tech-savvy learners in the digital learning environment?

Empirical research have showed that classroom management practices geared to digital environments greatly promote student engagement, foster responsible digital behavior, and improve academic achievement. As today's learners are increasingly engaged in technology, research supports the shift toward blending structured, interactive, and student-centered approaches in digitally enhanced classrooms. According to Sweller [10], off-task behavior was considerably lower in classrooms with explicit digital use guidelines, organized engagement procedures, and regular supervision. Classroom discipline and focus were better maintained by teachers who established clear expectations for device use, such as restricting access to social media or requiring the use of applications during particular activities, Correira, [11]

A well-liked tactic for involving online learners, gamification, has also produced encouraging empirical findings. Students in gamified classes reported increased motivation, more involvement, and better memory of the course material, Khan, Nabi, Khojah, & Tahir, [12]. Using tools like Kahoot!, Classcraft, and Quizizz enhanced cooperation, gave instant feedback, and created a competitive atmosphere that stoked student interest. Furthermore, Haleem, Javaid, Qadri, and Rajiv [13] discovered that students exhibited more independent learning behaviors and stronger student-teacher relationships when teachers took on the role of digital mentors, advising students on ethical online conduct, appropriate technology use, and collaborative tools.

Altavilla [14] highlighted the significance of teaching digital citizenship as a fundamental approach to classroom management. Cyberbullying and improper content usage were reported to be lower in schools that incorporated digital citizenship into their curriculum. Teaching kids about online responsibility, respect, and safety not only increased the classroom environment but also fostered self-regulation and digital accountability. Furthermore, Alvarado, Aragon, and Bretones' [15] empirical study verified that instructors' efficacy and confidence were much enhanced by professional development in digital classroom management. Teachers who were trained in the management of tech-integrated classrooms were more likely to strategically deploy a variety of instructional technologies, encourage participation with multimedia, and react properly to misbehavior on the internet.

Research Question 2: What challenges do teachers encounter in managing classrooms where students frequently use digital devices and platforms?

The presence of digital devices can undermine teachers' authority and control in the classroom. According to research by Adsiz & Dincer [16], teachers find it difficult to maintain classroom discipline when students have unrestricted access to mobile devices because it becomes more difficult to monitor students' screen time and online activities. Additionally, a significant percentage of students admitted to using their devices during class for non-academic purposes, such as social media or gaming. Teachers report that managing students' off-task behaviors due to distractions caused by digital devices is one of the biggest challenges they face.

Teachers' workload and stress levels rise as a result of managing digital platforms and integrating them into lessons. Olaniyan, Fakuade, Kanyama, and Balyejusa [17] claim that teachers frequently suffer from anxiety as a result of having to troubleshoot technical problems, update their digital literacy, and modify their teaching methods for technology-based settings. Ensuring fair access to digital technologies presents issues for teachers as well, particularly in classrooms with students from a variety of socioeconomic backgrounds. Gonzalez [18] emphasized that not every student has access to dependable technology or fast internet, resulting in inequalities that educators must overcome when teaching.

Cybersecurity and data privacy are also important issues. Although many lack adequate training in digital safety, teachers are frequently held accountable for guaranteeing the safe use of digital platforms in the classroom. In order to help reduce these threats, Mugume [19] highlights the necessity of teacher training on digital citizenship. The design and delivery of instruction must change significantly in order to incorporate technology into pedagogical practices. Adapting traditional teaching methods to a digital medium can be challenging for educators. Njenga [20] suggest that many teachers struggle with exploiting digital platforms in ways that enhances, rather than distract from, learning.

Research Question 3: How do digital tools and platforms influence student behavior, engagement and discipline in the classroom?

It has been demonstrated that digital platforms including gamified tools, educational apps, and learning management systems (LMS) increase student engagement. Ben-Amram & Davidovitch [21] found that students who used game-based learning platforms such as Quizlet and Kahoot! Increased motivation and participation in class. Compared to traditional approaches, digital tools' interactive characteristics encourage active learning and maintain attention spans more successfully. Personalized learning experiences catered to each student's needs are made possible by digital tools. Students feel more independent and invested in their education as a result of this flexibility.

According to Fanguy, Costley, and Almusharraf [22], students in adaptive learning technology-enabled classrooms showed more perseverance and accountability for their academic development than students in conventional classes. Peer interaction and teamwork are promoted by collaborative tools like online discussion boards, Microsoft Teams, and Google Docs. According to research by Jung & Shin [23], these kinds of platforms support cooperative learning practices and the development of social-emotional skills, which enhances classroom dynamics generally.

Digital gadgets have advantages, but they may also be sources of distraction. Silas & Mwila [24] noticed that students typically participate in off-task behaviors such as surfing social media, texting, or playing games during instructional time, resulting to reduced attention and behavioral disruptions. When properly integrated and regulated, digital tools can support classroom discipline by providing structured learning pathways, immediate feedback, and self-monitoring opportunities.

A study by Akpen, Asaolou, Atobatele et al. [25] found that students using structured digital learning environments demonstrated greater self-regulation and adherence to classroom rules. Constant access to digital communication platforms can occasionally lead to challenges regarding boundaries and appropriate behavior, Carstens, Mallon, Bataineh & Al-Bataineh, [26]. Digital multitasking has been linked to lower academic performance and behavioral issues, such as inattention and disrespect for classroom norms.

VIII.CONCLUSION

In the digital age, effective classroom management involves a move from old tactics to dynamic, technology-integrated strategies that correspond with the needs of tech-savvy learners. In order to foster engagement, cooperation, and responsible digital conduct, educators must embrace proactive, student-centered management strategies as digital tools and platforms continue to influence how students learn and interact. Modern classroom management requires not only upholding order and discipline but also creating a space that uses technology to encourage critical thinking and active learning. To successfully traverse the intricacies of today's tech-driven learning environments, educators need to be prepared with digital literacy skills, adaptive pedagogical techniques, and continual professional development.

In the end, incorporating cutting-edge classroom management techniques like establishing clear digital expectations, encouraging digital citizenship, utilizing interactive platforms, and implementing personalized learning tools can greatly improve student engagement, motivation, and academic achievement. Developing a classroom culture that is both technologically enhanced and pedagogically sound requires preparing teachers to engage and mentor digital-native students.

IX.RECOMMENDATIONS

Based on the conclusion, the following recommendations were made:

- Regular training sessions and seminars should be held by educational institutions with the goal of preparing instructors for the use of educational technology tools, digital literacy, and efficient digital classroom management techniques.
- Clear, student-friendly policies about the use of digital platforms and devices during class should be created and implemented by schools.
- To develop interesting and participative learning experiences, educators should use interactive platforms like gamified learning apps, learning management systems (like Google Classroom and Edmodo), and collaboration tools.

REFERENCES

[1]. Taylor, M., Fudge, A., Negin, M., & De Laat, M., (2021). Use of digital technology in education: Literature review. Prepared for the south Australian Department for education on behalf of the center for change and complexity in learning; the university of South Australia.

[2]. Wilkes, S., Kazakoff, E.R., Prescott, J.E., Bundschuh, K., Hook, P.E., Wolf, R., & Macarsso, P., (2020). Measuring the impact of a blended learning model on early literacy growth. Journal of computer assisted learning, 36(5), 595-609

[3]. Cheung, S.K., Phusavat, K., & Yang, H.H., (2021). Shaping the future learning environments with smart elements: Challenges and opportunities. International journal of educational technology in higher education, 18(1), 1-9. Doi:10:1186/s41239-021-00254-1

[4]. Nelson, L., (2025). Top strategies for teacher and technology integration in modern classrooms. https://www.afaeducation.org

[5]. Mohini, R., (2023). 18 tips for effective classroom management in the digital age. https://www.leadschool.in....

[6]. Zhao, X., Wang, J., Wang, M., Li, X., Gao, X., & Huang, C., (2020). A new model for assessing the impact of environmental psychology, e-learning, learning style and school design on the behavior of elementary students. Kyberneto, 50(2), 512-527

[7]. Hepburn, L., Beamish, W., & Alston-Knox, C. L., (2021). Classroom management practices commonly used by secondary school teachers: results from Queensland survey. Aust. Educ. Res, 48 (3), 485-505

[8]. Hao, Q., Barnes, B., & Jing, M., (2021). Quantifying the effects of active learning environment separating physical learning classrooms from pedagogical approaches, Learn environ res, 24(1), 109-122

[9]. Turnbull, D., Chugh, R., & Luck, J., (2021). Transitioning to E-learning during the COVID-19 pandemic: How have higher educational institutions responded to the challenge? Education and information technologies, 26 (5), 6401-6419

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

[11]. Correira, A.P., (2020). Healing the digital divide during the COVID-19 pandemic. Quarterly review of distance education, 21(1), 13-22

[12]. Khan, M.A., Nabi, M. K., Khojah, M., & Tahir, M., (2020). Students' perception towards e-learning during COVID-19 pandemic in India: An empirical study. Sustainability, 13(1), 57-64

[13]. Haleem, A., Javaid, M., Qadri, M. A., & Rajiv, S., (2022). Understanding the role of digital technologies in education: A review. Sustainable operations and computer, 3(2022), 275-285

[14]. Altavilla, J., (2020). How technology affects instruction for English learners. Phi Delta Kappan, 102 (1), 18-23

[15]. Alvarado, L.E., Aragon, R. R., & Bretons, F. D., (2020). Teacher's attitudes towards the introduction of ICT in Ecuadorian public school. Techtrends, 64(5), 498-505. https://doi.org/10.1007/s11528-020-00483-7

[16]. Adsiz, M & Dincer, S., (2023). The analysis of classroom management challenges faced by teacher in online classrooms. Techtrends, 69, 345-361. https://doi.org/10.1007/s115528-025-01042-8

[17]. Olaniyan, A.O., Fakuade, O.V., Kanyana, R., & Balyejusa, G., (2024). Distance learning and challenges of Technologies by students in Uganda. International journal of current science research and review, 7(10), 7971-7979

[18]. Gonzalez, L., (2021). E-learning in Brazil: Bridging the digital gap in education for rural students. Brazilian educational review, 45(2), 34-49

[19]. Mugume, P., (2021). Challenges facing higher educational institutions in delivery effective distance learning during the COVID-19 Pandemic in Uganda. International journal of education in mathematics, science and technology, 10(4), 372-384

[20]. Njenga, J. K., (2021). The impact of mobile data subsidies on e-learning in Kenya. Kenyan journal of educational technology, 20(1), 112-125

[21]. Ben-Amram, M., & Davidovitch, N., (2021). School and home as study spaces: Attitude of teachers, parents and students to e-learning during COVID-19 period: The case of Isreal. International journal of educational methodology, 7(4), 715-731. https://doi.org/10.12973/ijem.7.4.715

[22]. Fanguy, M., Costley, J., & Almusharraf, A., (2023). Online collaborative note-taking and discussed forum in flipped environments. Australasian journal of educational technology, 39(2), 142-158. https://doi.org/10.14742/ajet.8580

[23]. Jung, J., & Shin, Y., (2022). Re-conceptualizing digital literacy after COVID-19- A focus on elementary education. The Korean journal of literacy research, 13(2), 75-106. https://doi.org/10.37736/ KJLR, 2022.04.13.2-03

[24].Silas, T., & Nwila, P.M., (2024). The effects of technology adaptation on students' discipline in public secondary schools in Nyamagana district, Tanzania. InternationalJournal of education and development using information and communication technology, 20(1), 91-106

[25].Akpen, C.N., Asaolu, S., Atobatele et al, (2024). Impact of online learning on students' performance and engagement: a systematic review. Discov. Edu. 3, 205 (2024). https://doi.org/10.1007/s44217-028-00253-0

[26].Carstens, K.J., Mallon, J. M, Bataineh,M., & Al-Bataineh, A., (2021). Effects of teaching on student learning. The Turkish online journal of educational technology, 20(1), 105-113.