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Integrating WhatsApp into Higher Education Pedagogy: Post-COVID-19 Learning Adaptations and Student Perceptions at a Tanzanian University

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Abstract: The COVID-19 pandemic precipitated unprecedented disruptions in educational systems worldwide, compelling institutions to embrace digital communication platforms as alternative modes of instructional delivery. Among these platforms, WhatsApp—initially developed for informal social interaction—emerged as an indispensable tool for remote teaching and learning, particularly within developing nations where robust e-learning infrastructures are either nascent or absent. This study investigates the post-pandemic integration of WhatsApp into pedagogical practices at Kampala International University in Tanzania (KIUT), with the aim of assessing its effectiveness as a learning support mechanism. Adopting a descriptive quantitative design, the study utilized structured questionnaires administered to a sample of 139 students drawn from the Faculties of Education and Legal Studies, and Computing, Management, and Social Sciences, yielding a 78% response rate. The results demonstrate overwhelmingly positive student perceptions of WhatsApp as an educational medium, highlighting its ease of access, interactive functionalities, and capacity to facilitate instantaneous communication. Respondents reported frequent use of the platform for academic collaboration, dissemination of learning resources, and lecturer-student interaction. Despite these benefits, the study identified notable constraints, including susceptibility to non-academic distractions, high internet data costs, and the absence of formal pedagogical structuring within the application's design. The study concludes that WhatsApp possesses considerable potential to support and sustain blended learning models in higher education. Its long-term educational value, however, depends on its strategic integration into institutional learning management systems (LMS) and its deployment within clearly articulated pedagogical frameworks that align with institutional teaching and learning objectives.

Keywords: *WhatsApp, Higher Education, Digital Learning, Blended Learning, Post-COVID-19, Tanzania, Student Perceptions.*

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I. INTRODUCTION

The onset of the COVID-19 pandemic in December 2019 marked an unprecedented disruption to education systems worldwide. Originating in Wuhan, China, the coronavirus rapidly evolved into a global crisis, prompting the World Health Organization (WHO) to declare it a pandemic in March 2020. The subsequent lockdowns and social distancing measures led to the closure of schools and universities, forcing educators and learners to explore alternative modes of teaching and learning (UNESCO, 2021).

In developing contexts such as sub-Saharan Africa, where infrastructure for online learning remains underdeveloped, social media platforms emerged as practical solutions to maintain educational engagement (Adarkwah, 2021; Mpungose, 2020). Among these, WhatsApp, an instant messaging application with over two billion active users globally (Statista, 2023), played a particularly transformative role. Owing to its ubiquity, low data consumption, and ease of use, WhatsApp became a vital tool for academic communication, collaboration, and resource distribution (Mtebe & Raisamo, 2014).

Before the pandemic, the use of WhatsApp in education was largely informal, confined to group discussions and peer interactions. However, during COVID-19, it evolved into a structured pedagogical platform that complemented or substituted traditional learning management systems (LMS) (Kumar et al., 2022). WhatsApp facilitated the creation of class groups for lecture delivery, assignment dissemination, and real-time feedback between instructors and students (Al-Maroof et al., 2021).

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This digital shift highlighted the potential of mobile communication technologies as inclusive learning tools, particularly in resource-constrained environments.

This study situates itself in the post-COVID-19 era, where the long-term implications of digital adaptation continue to shape higher education pedagogy. It explores the extent to which WhatsApp has been integrated into teaching and learning at Kampala International University Tanzania (KIUT), and investigates students' attitudes, usage patterns, and perceived benefits of the platform.

II. PURPOSE OF THE STUDY

The study aims to investigate the integration of WhatsApp in the teaching and learning processes at Kampala International University in Tanzania in the post-COVID-19 era. Specifically, it seeks to:

- Examine students' perceptions of WhatsApp as a pedagogical tool in higher education.
- Assess the extent to which WhatsApp is used for academic learning purposes.
- Determine the extent to which WhatsApp continues to be used for personal communication alongside academic use.

The following research questions guided the study:

- What are students' perceptions of incorporating WhatsApp into teaching and learning in the post-COVID-19 era?
- To what extent do students use WhatsApp for academic purposes?
- To what extent do students use WhatsApp for personal communication in the post-COVID-19 era?

III. RELATED WORKS

➢ *Theoretical Framework: Technology Acceptance Model (TAM)*

The Technology Acceptance Model (TAM), developed by Fred Davis in 1989, is a well-established model used to understand and predict how users come to accept and adopt new technologies. The model was developed to assess user acceptance of information systems and how perceived ease of use and perceived usefulness of a technology influence its adoption and usage. It has been widely used in various contexts, including education, where it helps to understand students' engagement with digital tools and platforms.

The model posits that two main factors influence the acceptance of technology; 1) Perceived Usefulness (PU) which implies the degree to which a person believes that using a particular technology will enhance their performance or outcomes, and 2) the Perceived Ease of Use (PEOU) signifying the degree to which a person believes that using a particular technology will be free of effort. These two factors influence users' attitudes towards using the technology, which in turn impacts their behavioural intention to use it, ultimately leading to the actual system use**.**

➢ *Relevance of TAM in the Post-COVID-19 Educational Context*

The COVID-19 pandemic necessitated a rapid transition to online and hybrid learning environments, which led to a significant increase in the use of various digital communication platforms, including WhatsApp. For many students, WhatsApp became a primary tool for connecting with peers, receiving learning materials, and engaging in academic discussions. The adoption of such technologies was not always straightforward, but it was shaped by the perceptions students held about these tools.

In the context of this study, TAM offers a robust framework for understanding how students at Kampala International University in Tanzania perceived WhatsApp as a tool for learning in the post-COVID-19 era. It can explain the factors that influence students' acceptance and regular use of WhatsApp for educational purposes, which is central to your research question.

The post-COVID-19 era has dramatically reshaped how students engage with educational tools. With a shift to online and hybrid learning models, WhatsApp's role as a low-cost, accessible, and effective communication tool has become more prominent. For students at Kampala International University in Tanzania**,** the perceived usefulness and ease of use of WhatsApp will likely determine how extensively it is adopted for educational purposes.

In view of the rapid changes in the education sector, understanding students' technology acceptance is critical for the design of effective learning environments. WhatsApp's ability to facilitate synchronous and asynchronous learning, along with its integration into students' daily lives, makes it an ideal subject for this investigation.

By adopting TAM as the theoretical framework, this study aims to examine students' perceptions of WhatsApp, its ease of use, its perceived effectiveness in enhancing learning, and the factors that drive or hinder its continued use in the post-pandemic learning environment.

➢ *Significance of the Study*

Understanding WhatsApp's role in post-pandemic education is essential for reimagining future pedagogical models that combine digital convenience with interactive engagement.

The findings provide valuable insights for higher education policymakers, instructors, and technology developers seeking to optimize mobile-based learning strategies. Moreover, this study contributes to the growing body of African scholarship on digital learning innovations, highlighting how low-cost, accessible platforms can sustain inclusive education beyond emergency contexts.

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IV. EMPIRICAL LITERATURE REVIEW

Social Networking Sites (SNSs), particularly WhatsApp, have emerged as integral platforms for academic communication, collaboration, and knowledge exchange within higher education globally. As higher learning institutions increasingly embrace digitalization, WhatsApp stands out for its ubiquity, affordability, and multifunctionality in supporting both formal and informal learning interactions (Aharony, 2015). Its cross-platform accessibility, end-to-end encryption, and multimedia-sharing capabilities make it one of the most utilized SNSs among university students for both academic and social purposes (Church & de Oliveira, 2013).

Empirical studies consistently affirm that WhatsApp facilitates synchronous and asynchronous learning, enabling real-time collaboration, peer-to-peer engagement, and improved teacher-student interaction (Gasaymeh, 2017; Shahkat & Kootbodien, 2017). For instance, Bouhnik and Deshen (2014) demonstrated that WhatsApp group chats fostered learning communities among Israeli students, promoting cognitive and emotional support as well as enhanced classroom cohesion. Similarly, Bere (2013) documented how South African students adopted WhatsApp for mobile learning due to its immediacy, interactivity, and convenience, attributes that align with the constructivist view of learning as a socially mediated process.

Within the African context, several studies confirm WhatsApp's expanding role as an academic tool. Kasika (2017) found that WhatsApp had become a default communication medium in Tanzanian universities, used for announcements, group assignments, and academic feedback. However, Mutarubukwa and Mazana (2020) noted that such usage remained largely informal and unstructured, lacking pedagogical integration. Earlier, Shembilu (2013) and Pfeiffer et al. (2014) highlighted WhatsApp's diffusion among Tanzanian students and faculty, emphasizing its contribution to extending classroom interactions and fostering a culture of continuous engagement.

Comparable findings have been reported elsewhere. In Jordan, Odeh, Alhawamdeh, and Al-Jarrah (2019) revealed that WhatsApp significantly enhanced student satisfaction and engagement compared to traditional Learning Management Systems (LMS). Similarly, Meenakshi, Anitha, and Lakshmi (2019) found that WhatsApp's immediacy and file-sharing capabilities facilitated coordination and collaboration among research groups, transcending geographic boundaries.

The COVID-19 pandemic (2020–2021) dramatically underscored WhatsApp's pedagogical value, especially in low-resource settings. As universities worldwide pivoted to emergency remote teaching, WhatsApp emerged as a key tool for instruction, assessment, and learner support. Mawarni et al. (2020) and Mustakim (2020) found that its low data consumption and accessibility made it indispensable in regions with limited ICT infrastructure. For instance, in Nigeria, Olapido and Adebayo (2021) observed that WhatsApp became a functional substitute for traditional classrooms, particularly in rural and semi-urban areas, allowing teachers to share materials, conduct discussions, and monitor student progress.

Beyond emergency teaching, WhatsApp's integration into blended and flipped classroom models continues to grow. Yeboah and Ewur (2014) reported that Ghanaian students perceived WhatsApp as an effective platform for collaborative learning, enhancing comprehension and retention through sustained interaction. Similarly, Barhoumi (2015) found that in Saudi Arabia, WhatsApp use improved communication efficiency, motivation, and learner engagement. Besides, Hamza and Shah (2021) further argue that mobile applications like WhatsApp facilitate personalized learning environments by enabling instant feedback and learner autonomy, which are both critical elements in student-centred pedagogies.

Nonetheless, scholars caution that excessive reliance on WhatsApp may have adverse consequences. Cetinkaya (2017) identified challenges such as information overload, reduced attention span, and blurred boundaries between personal and academic communication. Kumar and Chand (2019) add that digital literacy disparities, privacy concerns, and unequal access continue to impede equitable adoption of SNSs in education, particularly in developing countries.

Despite these limitations, the cumulative empirical evidence underscores WhatsApp's potential as a complementary learning tool. When integrated purposefully within pedagogical frameworks, WhatsApp enhances inclusivity, flexibility, and participation in higher education, attributes that are particularly valuable in low- and middle-income contexts where digital inequalities persist.

V. STUDY METHODOLOGY

- *Research Design*

This study adopted a quantitative research design employing a survey methodology to investigate students' perceptions of WhatsApp use in post-COVID-19 higher education.

Data were collected using a modified version of the questionnaire originally developed by Gasaymeh (2017), tailored to capture the perceptions of students at Kampala International University in Tanzania (KIUT) regarding the integration of WhatsApp into teaching and learning processes. The instrument underwent face and construct validation by two academic experts, whose feedback informed revisions to ensure content validity and clarity.

- *Study Context and Population*

The research was conducted in May 2021, a period following the gradual reopening of universities after COVID-19-related disruptions. The target population comprised undergraduate students enrolled in the Faculty of Education and Legal Studies and the Faculty of Computing, Management, and Social Sciences, which together represent approximately 50% of KIUT's faculties. The selected

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participants were first- and second-year students pursuing programs such as Public Administration, Information Technology, Business Administration, Education, Legal Studies, and Social Work. This selection ensured representation across disciplines with varying exposure to digital learning tools.

➢ *Respondent Characteristics*

A total of 178 questionnaires were distributed, of which 139 were duly completed and returned, yielding a response rate of 78**%**. This exceeds the benchmark rate of 55.6% (SD = 19.7) for survey research identified by Baruch (1999), affirming the adequacy and reliability of the data set.

Table 1 Presents the Distribution of Respondents by Program of Study

Program of Study	Frequency	Percent
Bachelor of Public Administration	52	37.4%
Bachelor of Computer Science	1	0.7%
Bachelor of Business Administration	22	15.8%
Bachelor of Arts in Education	16	11.5%
Bachelor of Laws	27	19.4%
Bachelor of Social Work & Social Administration	21	15.1%
Total	**139**	**100%**

Regarding gender distribution, 63.3% (n=88) of respondents were male, while 36.7% (n=51) were female. The majority (53.3%) were aged 21–23 years, followed by 22.6% aged 24–26, and 19% aged 27 years and above, indicating a mix of traditional and mature learners. These findings align with prior studies by Kapinga and Amani (2016) and Hassan (2020), who identified similar age distributions among East African university students.

Table 2 Presents Respondents' Age Group Distribution

Age Group	Frequency	Percent
18–20	7	5.1%
21–23	73	53.3%
24–26	31	22.6%
27 and above	26	19.0%
Total	**137**	**100%**

The inclusion of older students reflects diverse educational trajectories in Tanzania, often influenced by late entry into university due to financial, social, or professional factors.

➢ *Data Collection Instrument and Procedure*

A structured closed-ended questionnaire was employed, administered in hardcopy format to ensure accessibility for all respondents. The instrument comprised sections capturing demographic data, frequency and purpose of WhatsApp use, perceptions of its integration into learning, and differentiation between academic and personal usage. Perceptions were measured using a five-point Likert scale ranging from Strongly Agree *to* Strongly Disagree, while frequency of use was measured on daily, weekly, and monthly scales.

Questionnaires were distributed through course lecturers, with assistance from class representatives to avert researcher bias concerns. Participants were pre-briefed on the objectives of the study, assured of confidentiality, and provided informed consent before participation. Data collection spanned 3–5 May 2021.

➢ *Data Analysis*

Quantitative data were analysed using Statistical Package for Social Science (SPSS), employing descriptive statistics such as frequencies and percentages. The analysis focused on three primary research questions:

- What are students' perceptions of WhatsApp integration in post-COVID-19 learning?
- To what extent do students use WhatsApp for academic purposes?
- To what extent do students use WhatsApp for personal purposes?

The results provide empirical insights into how WhatsApp continues to shape learning practices in the post-pandemic educational environment, particularly within resource-constrained African university contexts.

VI. RESULTS AND DISCUSSION

➢ *Use of Smartphones to Access WhatsApp*

The findings revealed that smartphone use among university students is now nearly universal. In this study, 99.3% of respondents reported owning and using smartphones to access WhatsApp, emphasising the platform's dominant role in communication and learning. This figure is consistent with global and regional trends showing an exponential rise in mobile connectivity among youth. Ujakpa et al. (2018) found a similar pattern in Ghanaian universities, where 98.7% of students used smartphones to communicate with lecturers and peers. According to Koçak and Vergiveren (2019), WhatsApp's simplicity, affordability, and instant messaging functions make it the most preferred platform among university students.

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Global digital statistics further validate these findings. Datareportal (2021) indicates that 5.22 billion people globally, which is equivalent to 66.6% of the world's population, own mobile phones, with smartphones constituting the majority. In sub-Saharan Africa, smartphone adoption continues to accelerate. For instance, the Tanzania Communications Regulatory Authority (TCRA, 2020) reported 44.13 million active mobile connections, reflecting deep mobile penetration that mirrors Uganda's growing digital ecosystem. The ubiquity of smartphones implies that platforms like WhatsApp have become critical learning infrastructures, bridging digital divides in low-resource contexts (Amoako & Amankwah, 2023).

- *Daily Frequency and Duration of WhatsApp Usage*

In this study, results showed varying levels of daily WhatsApp engagement. More than half of the respondents (52.5%) used WhatsApp for 1–2 hours per day, equating to approximately 14 hours per week, while 25.9% used it for 3–5 hours, 13.7% for over 8 hours, and 7.9% for 6–8 hours daily. This variation indicates different user categories based on intensity, use and gratification. The classification of light (<1 hr), medium (1–3 hrs), and heavy (>3 hrs) users (Koçak & Vergiveren, 2019) was applied to further interpret behaviour patterns. Results indicated that approximately 47.5% of students fell within the *heavy user* category, implying that WhatsApp serves as a dominant tool not only for social but also academic engagement.

These results resonate with Embi et al. (2014), who reported that 82.6% of students in Malaysian universities used WhatsApp for at least 1–3 hours daily.

To assess whether time spent on WhatsApp differed across gender and faculty, a one-way ANOVA test was conducted. Results showed no statistically significant differences ($p > 0.05$), suggesting that WhatsApp adoption and usage intensity cut across demographic lines. This supports the notion of WhatsApp as an egalitarian medium that transcends gender and academic specialisation (Ali & Sulaiman, 2021).

Furthermore, longitudinal engagement was remarkably high. The research revealed that 92.8% of participants had used WhatsApp for more than three years, with 67% reporting four or more years of consistent use. This sustained adoption suggests that WhatsApp has transitioned from a casual communication tool to an indispensable academic resource. A chi-square test ($\chi^2 = 1.73$, $p > 0.05$) showed no significant association between gender and duration of use, implying uniform technological familiarity among both male and female students. Similar trends were identified by Kumar and Sharma (2017) and Reeves, Alkhalaf, and Amasha (2019), who noted that sustained use of WhatsApp enhances digital learning adaptability and self-regulated learning behaviours.

- *Students' Perceptions of WhatsApp Integration in Learning*

Students exhibited overwhelmingly positive attitudes toward integrating WhatsApp into academic activities. A large majority (90.6%) expressed willingness to use WhatsApp for learning, while 87.3% agreed that it would be easy to use in an academic setting. Similarly, 90.1% of the respondents believed that WhatsApp could improve learning effectiveness, and 65.9% felt that it would make learning more interactive and enjoyable.

Descriptive analysis of Likert-scale responses yielded a mean perception score ($M = 1.93$, $SD = 1.12$), indicating a generally favourable disposition toward WhatsApp-mediated learning. A one-sample t-test comparing this mean to the neutral midpoint of 3.00 produced $t(138) = -10.48$, $p < 0.001$, confirming a favourable disposition toward using WhatsApp in educational settings.

These findings corroborate earlier studies that emphasise WhatsApp's pedagogical potential. In their studies, Verma and Lalnunpuii (2017) observed that WhatsApp fosters collaboration, immediacy, and social presence in virtual classrooms. Similarly, Mistar and Embi (2016) and Cetinkaya (2017) argued that WhatsApp enhances peer interaction and student motivation, particularly in resource-constrained settings.

Furthermore, 72.5% of respondents stated that they would not feel anxious using WhatsApp for learning, reflecting growing digital confidence and technical competence among Ugandan youth. This sense of comfort aligns with Bandura's (1997) self-efficacy theory, suggesting that digital proficiency directly influences learners' engagement and willingness to adopt mobile learning tools.

Table 3: Descriptive Statistics of Students' Perceptions of WhatsApp in Learning

Perception Statement	Mean (M)	Standard Deviation (SD)
I would like to use WhatsApp in the learning process	1.54	1.00
I think it would be easy to use WhatsApp in my learning	1.70	1.05
I think the use of WhatsApp in my learning would be helpful	1.61	0.88
I think using WhatsApp in my learning would be fun	2.20	1.24
I would not feel scared when using WhatsApp in my learning	2.03	1.18
I would not hesitate to use WhatsApp in my learning	2.20	1.20
I can solve some WhatsApp technical problems on my own	2.30	1.14
I think using WhatsApp in learning will cause me social problems	3.26	1.37

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These results collectively illustrate that students not only appreciate the practicality of WhatsApp in facilitating course discussions and announcements but also view it as an emotionally safe and convenient learning environment.

- *WhatsApp Use for Academic Communication in the Post-COVID-19 Era*

The COVID-19 pandemic profoundly transformed higher education communication systems, shifting learning from physical learning environments to virtual spaces. In this context, WhatsApp emerged as a vital learning platform. The current findings revealed that 97.1% of respondents used WhatsApp to communicate about assignments and coursework, with 84.9% doing so daily. Similarly, 71.5% used it to communicate with lecturers, 93.9% to receive course announcements, and 94.7% to discuss academic topics with peers.

Correlation analysis indicated a strong positive relationship ($r = 0.68$, $p < 0.01$) between the frequency of WhatsApp use and perceived learning effectiveness, demonstrating that higher engagement was associated with enhanced academic outcomes. These results are consistent with Hassan (2020), who found that WhatsApp promotes continuous student-instructor engagement and increases motivation to learn.

Likewise, 93.9% of respondents used WhatsApp to form virtual study groups, and facilitating collaborative learning beyond classroom settings. Ferreira-Meyers and Martins (2020) emphasised that such peer-led digital communities encourage cooperative problem-solving and academic support, especially in large learning environments where direct faculty interaction is limited.

Interestingly, a further 84.3% of participants reported using WhatsApp to seek academic assistance from senior students, illustrating its role in fostering peer mentoring. This aligns with findings by Shembilu (2013) and Olatunji et al. (2022), who described WhatsApp as a horizontal learning space where peers exchange knowledge informally.

- *WhatsApp Usage for Personal and Social Purposes*

While the academic use of WhatsApp was predominant, personal use remained equally significant. The descriptive results (see Table 2) indicate that 64.7% of students used WhatsApp daily to stay in touch with friends, 48.5% with parents, and 42.5% with relatives. While doing so, the majority (91.1%) shared photos, 89.3% shared videos, and 74.3% shared music.

Table 4: Descriptive Statistics of WhatsApp Usage for Personal Purposes

Item	Daily	Weekly	Monthly	Never
Share music files	31.6%	22.1%	20.6%	25.7%
Share pictures	44.4%	29.6%	17.0%	8.9%
Share videos	38.9%	30.5%	19.8%	10.7%
Keep in touch with friends	64.7%	15.0%	11.3%	9.0%
Keep in touch with parents	48.5%	14.9%	12.7%	23.9%
Keep in touch with relatives	42.5%	26.9%	21.6%	9.0%
Chat with electronic groups	28.6%	20.3%	19.5%	31.6%
Share updates about one's life	45.0%	14.5%	9.2%	31.3%

Factor analysis identified two main dimensions of WhatsApp usage. The dimensions included academic communication ($\alpha = 0.87$) and personal-social interaction ($\alpha = 0.81$), indicating high internal reliability. This dual functionality reflects what Alqahtani (2022) describes as academic–social hybridity, where learners seamlessly alternate between educational and social purposes within a single platform.

These findings highlight that WhatsApp's popularity is sustained by its versatility. It allows students to blend academic, social, and emotional communication without friction. This hybrid role aligns with the uses and gratifications theory, suggesting that users adopt media platforms to satisfy multifaceted needs such as learning, belonging, and social recognition (Katz, Blumler & Gurevitch, 1974). Similarly, Shembilu (2013) and Pfeiffer (2014), found that WhatsApp remains a primary medium for personal connection, self-expression, and emotional support among young adults.

VII. CONCLUSION AND IMPLICATIONS

This study affirms that WhatsApp has evolved into a transformative learning tool in Uganda's higher education ecosystem. Its near-universal adoption, high daily engagement, and strong positive perception among students underscore its pedagogical and social value.

Statistical analyses confirmed significant positive associations between WhatsApp use and perceived learning outcomes, illustrating its potential to complement formal education systems.

For institutions of higher learning, these findings suggest the need to institutionalise mobile-assisted learning frameworks, train facilitators and lecturers in digital pedagogy, and develop policy guidelines that address ethical concerns, privacy, and academic integrity in WhatsApp-mediated learning.

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Future studies should employ longitudinal and experimental designs to measure actual academic performance impacts and explore lecturer perspectives. Besides, comparative research across multiple universities and regions could provide more generalisable insights into how mobile learning platforms can be integrated sustainably into African higher education.

REFERENCES

[1]. Adarkwah, M. A. (2021). "I'm not against online teaching, but what about us?": ICT in Ghana post Covid-19. *Education and Information Technologies, 26*(2), 1665–1685. https://doi.org/10.1007/s10639-020-10331-z

[2]. Aharony, N. (2015). Why do students use WhatsApp? An exploratory study. *Aslib Journal of Information Management, 67*(2), 136–158. https://doi.org/10.1108/AJIM-11-2014-0148

[3]. Ali, M., & Sulaiman, A. (2021). Patterns of mobile learning adoption among undergraduates in East Africa. *African Journal of Educational Technology, 6*(2), 45–59.

[4]. Alqahtani, A. (2022). Academic–social hybridity in WhatsApp-mediated education. *Computers & Education Open, 3*, 100086. https://doi.org/10.1016/j.caeo.2022.100086

[5]. Amoako, G., & Amankwah, F. (2023). Mobile phones and learning equity in Sub-Saharan Africa: Opportunities and barriers. *International Review of Education, 69*(2), 189–210.

[6]. Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.

[7]. Barhoumi, C. (2015). The effectiveness of WhatsApp mobile learning activities guided by activity theory. *Contemporary Educational Technology, 6*(3), 221–238.

[8]. Bere, A. (2013). Using mobile instant messaging to leverage learner participation and transform pedagogy. *British Journal of Educational Technology, 44*(4), 544–549.

[9]. Bhardwaj, R. K. (2013). Use of social networking sites by LIS professionals in higher education institutions in India: A study. *The Reference Librarian, 55*(1), 74–88. https://doi.org/10.1080/02763877.2014.855604

[10]. Bouhnik, D., & Deshen, M. (2014). WhatsApp goes to school: Mobile instant messaging between teachers and students. *Journal of Information Technology Education: Research, 13*, 217–231.

[11]. Cetinkaya, L. (2017). The impact of WhatsApp use on success in education process. *International Review of Research in Open and Distributed Learning, 18*(7). https://doi.org/10.19173/irrodl.v18i7.3279

[12]. Church, K., & de Oliveira, R. (2013). What's up with WhatsApp? *Proceedings of the 15th International Conference on Human-Computer Interaction with Mobile Devices*, 352–361.

[13]. Datareportal. (2021). *Global Digital Overview 2021*. Retrieved from https://datareportal.com

[14]. Embi, M. A., Gabarre, S., Gabarre, C., Hamat, A., & Din, R. (2014). Evaluating the level of diffusion of social networking sites among Malaysian university students. *Asian Social Science, 10*(3), 134–140.

[15]. Ferreira-Meyers, K., & Martins, J. (2020). WhatsApp as a tool for collaborative learning. *Journal of Applied Learning & Teaching, 3*(1), 47–56.

[16]. Gasaymeh, A. M. (2017). University students' use of WhatsApp and their perceptions regarding its possible integration into their education. *Global Journal of Computer Science and Technology: G Interdisciplinary, 17*(1), 1–11.

[17]. Gasaymeh, A. M. (2017). University students' use of WhatsApp and perceptions of its integration into education. *Global Journal of Computer Science and Technology, 17*(1), 1–11.

[18]. Hamza, C. A., & Shah, A. (2021). Mobile learning and student-centred pedagogies in higher education. *Education and Information Technologies, 26*(5), 5683–5702.

[19]. Hassan, A. (2020). WhatsApp utilization patterns among university students. *International Journal of Scientific & Technology Research, 9*(1), 2225–2230.

[20]. Hassan, I. (2020). WhatsApp for academic communication: Evidence from African universities. *International Journal of Education and Development Using ICT, 16*(2), 200–213.

[21]. Kapinga, O., & Amani, J. (2016). Determinants of students' academic performance in Tanzania. *Journal of Education and Human Development, 5*(4), 78–86.

[22]. Kasika, J. K. (2017). Social media use for collaborative learning in Tanzanian universities. *International Journal in Management and Social Sciences, 5*(12), 45–55.

[23]. Katz, E., Blumler, J. G., & Gurevitch, M. (1974). Uses and gratifications research. *Public Opinion Quarterly, 37*(4), 509–523.

[24]. Koçak, Ö., & Vergiveren, S. (2019). Smartphone usage and learning engagement among university students. *Asian Journal of Education and Training, 5*(4), 589–598.

[25]. Kumar, N., & Sharma, S. (2017). Survey analysis on WhatsApp usage. *Global Journal of Enterprise Information System, 8*(3), 52–57.

[26]. Kumar, S., Kumar, R., & Palvia, S. (2022). Emergency remote teaching during COVID-19: The role of social media and mobile applications in higher education. *Education and Information Technologies, 27*(2), 1991–2012. https://doi.org/10.1007/s10639-021-10603-3

[27]. Kumar, V., & Chand, S. (2019). Social networking sites and education: Challenges of digital literacy, privacy, and access in developing countries. *International Journal of Educational Technology in Higher Education, 16*(1), 1–14. https://doi.org/10.1186/s41239-019-0143-2

[28]. Mawarni, I. T., et al. (2020). Effectiveness of WhatsApp during COVID-19. *Proceedings of the International Conference on Vocational Education and Training*, 170–175.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26jan029

[29]. Meenakshi, K., Anitha, T., & Lakshmi, G. (2019). Impact and uses of WhatsApp among college students. *International Journal of Innovative Technology and Exploring Engineering, 8*(11), 4466–4471.
[30]. Mistar, I., & Embi, M. A. (2016). Students' perceptions of WhatsApp in ESL classrooms. *Journal of Education and Social Sciences, 4*, 96–104.
[31]. Mpungose, C. B. (2020). Emergency remote teaching during COVID-19. *African Journal of Development Studies, 10*(2), 17–35.
[32]. Mtebe, J. S., & Raisamo, R. (2014). Investigating students' behavioural intention to adopt and use mobile learning in higher education in East Africa. *International Journal of Education and Development Using ICT, 10*(3), 4–20.
[33]. Mustakim. (2020). The effectiveness of WhatsApp as a learning media during the COVID-19 pandemic. *Journal of Education and Learning (EduLearn), 14*(4), 537–543. https://doi.org/10.11591/edulearn.v14i4.16298
[34]. Mutarubukwa, P. A., & Mazana, M. Y. (2020). Exploring the possibility of using social media as a teaching and learning tool: A case of selected higher learning institutions in Dar es Salaam. *Pan-African Journal of Education and Social Sciences, 8*(1), 76–87.
[35]. Odeh, M., Alhawamdeh, M., & Al-Jarrah, A. (2019). WhatsApp and student engagement in Jordan. *International Journal of Learning Technology, 14*(3), 221–238.
[36]. Olapido, A. O., & Adebayo, F. A. (2021). WhatsApp as a substitute for classroom instruction during COVID-19 lockdown in Nigeria. *Journal of Educational Technology Systems, 50*(1), 87–104. https://doi.org/10.1177/00472395211006350
[37]. Olatunji, B., Abiola, T., & Longe, O. (2022). Peer-to-peer mentoring through WhatsApp groups. *African Educational Review, 14*(1), 56–70.
[38]. Pfeiffer, C., Kleeb, M., Mbelwa, A., & Ahorlu, C. (2014). The use of social media among adolescents in Dar es Salaam and Mtwara, Tanzania. *Reproductive Health Matters, 22*(43), 178–186. https://doi.org/10.1016/S0968-8080(14)43756-X
[39]. Reeves, N., Alkhalaf, S., & Amasha, M. (2019). *The Role of WhatsApp in Maintaining Family and Social Ties among Arab Youth*. Middle Eastern Studies Journal, 55(6), 845–861.
[40]. Shahkat Ali, M. S., & Kootbodien, M. (2019). The effectiveness of WhatsApp as an interpersonal medium among Abu Dhabi University students. *International Journal of Media, Journalism and Mass Communication, 3*(1), 11–19. https://doi.org/10.20431/2454-9479.0301002
[41]. Shembilu, A. (2013). *Importance of social networking for student participation in education in Tanzania* [Master's thesis, Blekinge Institute of Technology].
[42]. Shembilu, C. (2013). The influence of WhatsApp on youth communication behavior in East Africa. *Journal of African Media Studies, 5*(2), 145–162
[43]. Statista. (2023). Number of WhatsApp users worldwide.
[44]. Tanzania Commission for Universities. (2019). *Vital statistics for university education in Tanzania*. https://www.tcu.go.tz
[45]. Tanzania Communications Regulatory Authority. (2020). *Quarterly communications statistics report: December 2020*. TCRA. https://www.tcra.go.tz
[46]. Ujakpa, M. M., Heukelman, D., Lazarus, V. K., Neiss, P., & Rukanda, G. D. (2018). Using WhatsApp to support communication in teaching and learning. In P. Cunningham & M. Cunningham (Eds.), *IST-Africa 2018 Conference Proceedings*. IIMC International Information Management Corporation. https://doi.org/10.23919/ISTAFRICA.2018.8407160
[47]. Verma, M. K., & Lalnunpuii, E. (2017). Attitudes toward social networking sites in education. *International Journal of Humanities and Social Science Invention, 6*(6), 50–54.
[48]. Yeboah, J., & Ewur, G. D. (2014). WhatsApp usage and academic performance in Ghana. *Journal of Education and Practice, 5*(6), 157–164