Research Article

Investigating Socially Mediated Educational Communication through WhatsApp and Telegram: Perception and Preference of Students and Teachers

Sunita Saikia[1], Mohammad Asif[2] & Yeasmin Sultana[3]

[1]Research Scholar, Department of Education, Tezpur University, Assam

Email- sunitasaikia2015@gmail.com

[2]Assistant Professor, Department of Education, Tezpur University, Assam

[3]Assistant Professor, Department of Education, Tezpur University, Assam

Abstract

The COVID-19 pandemic has compelled the academic community to choose various social networking applications as an important avenue for interaction with students and teachers. WhatsApp and Telegram applications have emerged as efficient tools in the education process. With this background, the present study aimed to explore the perception and preferences of students and teachers towards the use of WhatsApp and Telegram as educational tools. The study used the descriptive quantitative method to collect data from 150 samples (100 UG students and 50 UG teachers) through a convenience sampling technique. A self-developed perception questionnaire with a Cronbach Alpha value of 0.917 was used to gather data. The percentage analysis indicated that the majority of the teachers have a favourable perception of the use of WhatsApp and Telegram as educational tools. However, the majority of the students have a favourable perception of the use of WhatsApp and a neutral perception of the Telegram application. The result found that both students and teachers mostly prefer WhatsApp as an effective tool in the education process.

Keywords: Perception, preference, social networking applications, WhatsApp, Telegram, educational tool

Introduction

The COVID-19 pandemic has led to internet-based communication as an important avenue for interaction with students and teachers. Various communication platforms like Facebook, WhatsApp, Telegram, and other applications are universally used in the world of education for interacting, sharing information and knowledge, networking and conducting research. The use of these applications is an innovative teaching and learning style in the 4.0 education era (Susilo & Amirullah, 2021). Social networking applications facilitate the creation of virtual communities for sharing common interests or exploring new ones. This allows for both real-time and asynchronous educational communication, promoting student collaboration, global knowledge exchange, and personalised learning. The rate of use of such platforms in education has increased significantly over the past few years. WhatsApp is the most used app in India, with over 53 crores of users and Instagram has 21 crores of users (Chakravarti, 2021). As reported by the Statista business data platform, "WhatsApp, with 2,000 million users, became the most popular messenger in the world as of January 2021 and Telegram with 500 million users" (STATISTA, 2021a)

(as cited by Prokopyev, 2021). Hence, understanding the perceptions of students and teachers on educational communication platforms is a valuable source of information for educators and researchers.

Literature Review

The integration of WhatsApp into classroom learning can result in an easier, more fun and more useful way of learning (Susilo & Amirullah, 2021; Bansal & Joshi, 2014). Nitza and Roman (2016) elucidate that WhatsApp has a significant positive impact on students' learning outcomes and satisfaction with learning activities. Lazzam-Khraiwish, Bataineh, and Alzyod (2021) and Sari (2018) recommended the necessity of implementing WhatsApp as a strategy for improving students' English speaking skills. Gutierrez-Colon Plana, Gimeno, Appel, and Hopkins (2013) found that WhatsApp increases their satisfaction and willingness to learn resulting in positive impacts on students' reading habits, regularity and confidence. It simulates a socially constructive environment for learning (Naidoo & Kopung, 2016). Telegram can be an effective medium for sharing information and learning experiences for students and teachers (Mahdiuon, Salimi, & Raeisy, 2020). Ebrahimpour et al. (2016) found most students use and prefer Telegram for educational communication. Xodabande (2017) claimed that apart from using Telegram as an instant messaging application, it can also be used for improving language learning purposes and vocabulary learning (Alakrash, Razak and Bustan, 2020). Telegram promotes students'

critical thinking skills and expands their knowledge with immediate feedback from the instructor turns out to be an important contributor to learning (Habibi et al., 2018).

Purpose of the Study

Earlier literature reviews identified that WhatsApp and Telegram applications emerged as efficient tools in the education process. With this view, the researcher believed that discovering teachers' and students' perceptions about the use of WhatsApp and Telegram as educational tools will help to make versed decisions for improving the educational potential and effectiveness. Based on this purpose, the following research questions were formulated:

RQ 1. What is the perception of the teachers teaching at the UG level about the use of WhatsApp and Telegram in the educational context?

RQ 2. What is the preference of the teachers teaching at the UG level regarding the use of WhatsApp and Telegram in the educational context?

RQ 3. What is the perception of undergraduate students about the use of WhatsApp and Telegram in the educational context?

RQ 4. What is the preference of undergraduate students regarding the use of WhatsApp and Telegram in the educational context?

Research Methodology

This study investigated teachers' teaching at the UG level and undergraduate students' perceptions and preferences towards the use of WhatsApp and Telegram applications. A descriptive quantitative research method was

adopted to obtain the perceptions of the respondents. The study population included undergraduate students pursuing Bachelor of Arts (BA) and the teachers involved in the teaching of Bachelor of Arts (BA) at the college level. A total of 100 undergraduate students and 50 teachers teaching at the UG level from 3 different colleges in the Sonitpur district participated in the study.

Table-1: Demographic Profile of the Samples

S.No	No. of Students	No. of Teachers
1	40	23
2	35	15
3	25	12
Total	100	50

The researchers employed a convenience sampling technique for this study. The selection process for respondents involved choosing participants who willingly agreed to participate in the survey and subsequently completed the questionnaire using Google Forms. The data was gathered within the timeframe of the COVID-19 pandemic spanning from January to March 2021. The questionnaire was developed to collect the perceptions and preferences of both teachers and students regarding the use of WhatsApp and Telegram applications as educational tools. The questionnaire consists of 10 items that measure the use of the application within the context of teaching and learning, as well as the individual's communication skills, interpersonal relations, and any potential barriers encountered. The questionnaire underwent a process of validation conducted by experts specializing in the field of educational technologies. A pilot study was undertaken to assess the questionnaire's reliability and internal consistency. The Cronbach Alpha coefficient for the entire dataset was determined to be 0.917, as presented in Table 2. The data were systematically collected, recorded, and subsequently analysed using Excel Software.

Table-2: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.917	.919	10

Results

The results of the study are presented in tabulation and graphical representations in four sections as per the objectives.
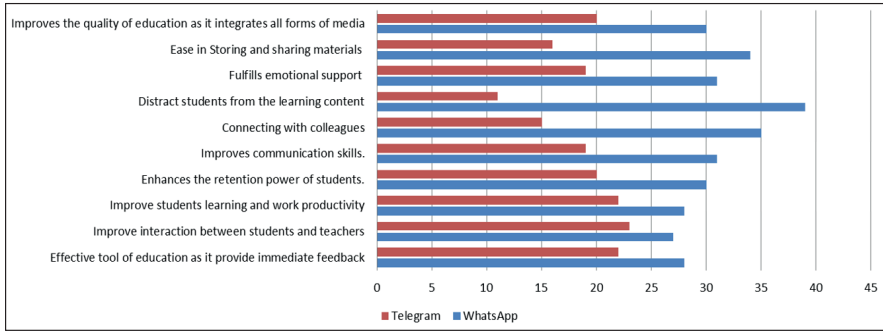
RQ 1. *Perceptions of Teachers about the use of WhatsApp and Telegram in the educational context*

Table-3: Frequencies and Percentage (N=50) of Perceptions of Teachers about the use of WhatsApp and Telegram in the educational context

Items	WhatsApp			Telegram		
	F	N	U	F	N	U
Effective tools of education as it provides immediate feedback	28 (56%)	13 (26%)	09 (18%)	22 (44%)	12 (24%)	16 (32%)
Improve interaction between students and teachers	27 (54%)	18 (36%)	05 (10%)	23 (46%)	14 (28%)	13 (26%)
Improve students learning and work productivity	28 (56%)	17 (34%)	05 (10%)	22 (44%)	13 (26%)	15 (30%)
Enhances the retention power of students.	30 (60%)	16 (32%)	04 (8%)	20 (40%)	16 (32%)	14 (28%)
Improves communication skills.	31 (62%)	12 (24%)	07 (14%)	19 (38%)	19 (38%)	12 (24%)
Connecting with colleagues	35 (70%)	06 (12%)	09 (18%)	15 (30%)	21 (42%)	14 (28%)
Distract students from the learning content	39 (78%)	06 (12%)	05 (10%)	11 (22%)	22 (44%)	17 (34%)
Fulfills emotional support	31 (62%)	15 (30%)	04 (8%)	19 (38%)	21 (42%)	10 (20%)
Ease in Storing and sharing materials	34 (68%)	08 (16%)	08 (16%)	16 (32%)	18 (36%)	16 (32%)
Improves the quality of education as it integrates all forms of media	30 (60%)	16 (32%)	04 (8%)	20 (40%)	19 (38%)	11 (22%)
Overall Total	63%	25%	12%	37%	35%	28%

*F= Favourable, N=Neutral, U=Unfavourable

Figure-1: Perceptions of Teachers about the use of WhatsApp and Telegram in the educational context


The result of the data presented in Table 3 and Figure 1 revealed that the majority of the teachers have a favourable perception of the use of WhatsApp and Telegram in education. 63 per cent of teachers were in favour of WhatsApp and about 37 per cent were in favour of Telegram. 56 per cent and 44 per cent of teachers perceived that WhatsApp and Telegram are an effective tool for education as they provide immediate feedback. 54 per cent and 46 per cent agreed that both these applications improve the interaction between students and teachers. While 56 per cent and 44 per cent of teachers agreed with the statement that WhatsApp and Telegram improve students' learning and work productivity. 60 per cent and 40 per cent of teachers perceived that WhatsApp and Telegram enhance the retention power of students. 62 per cent and 38 per cent indicated that it improves communication skills. While the data showed that 70 per cent of teachers have a favourable perception of WhatsApp as a tool for interacting

or connecting with their colleagues, whereas, teachers (42 per cent) have a neutral perception of Telegram as a medium of connection with colleagues. Similarly, a majority (78 per cent) of the teachers perceived that WhatsApp can distract students from the learning content and in terms of Telegram, they (44 per cent) have a neutral perception. 62 per cent of teachers found that WhatsApp can establish emotional support among students and colleagues, and only 42 per cent had a neutral view of Telegram. 68 per cent of respondents have shown a level of agreement on ease in storing and sharing materials on WhatsApp, while in terms of Telegram, 36 per cent of teachers have a neutral perception of it. Lastly, 60 per cent and 40 per cent of teachers were in favour of WhatsApp and Telegram as they improve the quality of education by integrating all forms of media.

RQ 2. *Preference of the teachers toward the use of WhatsApp and Telegram in the educational context*

Figure-2: presents the Preference of the teachers toward the use of WhatsApp and Telegram in an educational Context
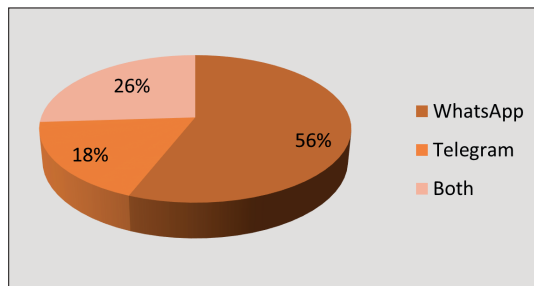
In Figure 2, it has been presented that about 56 per cent of teachers mostly prefer the use of WhatsApp, again 26 per cent of teachers prefer both WhatsApp and Telegram and around 18 per cent of them prefer using Telegram in terms of educational context.
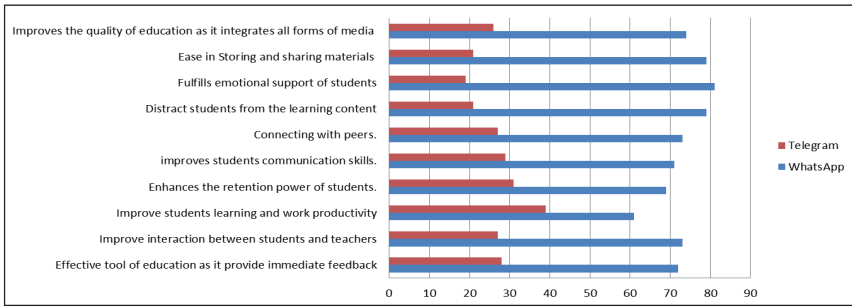
RQ 3. *Perceptions of students about the use of WhatsApp and Telegram in the educational context*

Table-4: Frequencies and Percentage (N=100) of Perceptions of students about the use of WhatsApp and Telegram in the educational context

| Items	WhatsApp			Telegram		
	F	N	U	F	N	U
Effective tools of education as it provides immediate feedback	72 (72%)	19 (19%)	09 (9%)	28 (28%)	42 (42%)	30 (30%)
Improve interaction between students and teachers	73 (73%)	21 (21%)	06 (6%)	27 (27%)	41 (41%)	32 (32%)
Improve students learning and work productivity	61 (61%)	22 (22%)	17 (17%)	39 (39%)	47 (47%)	14 (14%)
Enhances the retention power of students	69 (69%)	18 (18%)	13 (13%)	31 (31%)	38 (38%)	31 (31%)
Improves communication skills	71 (71%)	22 (22%)	07 (7%)	29 (29%)	46 (46%)	25 (25%)
Connecting with peers	73 (73%)	23 (23%)	04 (4%)	27 (27%)	49 (49%)	24 (24%)
Distract students from the learning content	79 (79%)	17 (17%)	04 (4%)	21 (21%)	48 (48%)	31 (31%)
Fulfills emotional support	81 (81%)	15 (15%)	04 (4%)	19 (19%)	55 (55%)	26 (26%)
Ease in Storing and sharing materials	79 (79%)	18 (18%)	03 (3%)	21 (21%)	40 (40%)	39 (39%)
Improves the quality of education as it integrates all forms of media	74 (74%)	20 (20%)	06 (6%)	26 (26%)	52 (52%)	22 (22%)
Overall Total	73%	20%	7%	27%	46%	27%

*F= Favourable, N=Neutral, U=Unfavourable

An analysis of the results related to the perceptions of students towards the use of WhatsApp and Telegram, as presented in Table 4 and Figure 3, showed that the majority of the students have a favourable perception of the use of WhatsApp. However, students have a neutral perception of the Telegram application. 73 per cent of students were highly in favour of WhatsApp, while 46 per cent were neutral to Telegram. In all, 72 and 42 out of the 100 students, representing 72 per cent and 42 per cent of students, perceived that WhatsApp and Telegram are effective tools for education as they provide immediate feedback. 73 per cent and 41 per cent agreed that both these applications improve the interaction between students and teachers. While 61 per cent and 47 per cent of students agreed with the statement that WhatsApp and Telegram improve their learning and work productivity. 69 per cent and 38 per cent agreed that this application enhances their retention power. 71 per cent and 46 per cent indicated that it improves communication skills. The data showed that 73 per cent of students have a favourable perception of WhatsApp as a tool for interacting or connecting with their peers, whereas, only 49 per cent of students have a neutral perception of Telegram as a medium of connection with peers. The majority (79 per cent) of the students agreed that WhatsApp distracts them from the learning content, and in terms of Telegram, 49 per cent of them have a neutral perception. 81 per cent of students find that WhatsApp can also establish emotional support between peers and teachers while only 55 per cent had a neutral view towards Telegram. 79 per cent of respondents have shown a level of agreement on ease in storing and sharing materials on WhatsApp, while in terms of Telegram, 40 per cent of them have a neutral perception of it. Lastly, 74 per cent and 52 per cent of students were in favour of WhatsApp and Telegram as they improve the quality of education by integrating all forms of media.

RQ 4. *Preference of the students toward the use of WhatsApp and Telegram in Educational Context*

Figure-4: presents the Preference of the students toward the use of WhatsApp and Telegram in an educational context
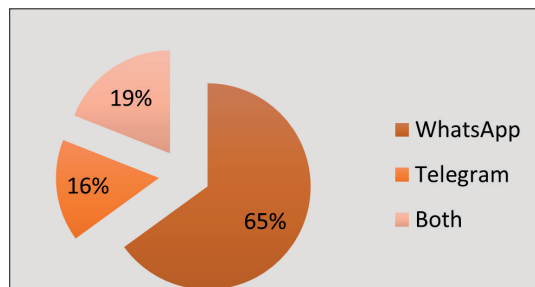
In Figure 4, it has been presented that about 65 per cent of students mostly prefer the use of WhatsApp, again 19 per cent of them prefer both WhatsApp and Telegram and around 16 per cent of them prefer using Telegram in terms of educational context.

Discussions

Perceptions of students and teachers about the use of WhatsApp and Telegram in the educational context

The results of the present study corroborate with the findings of Singh et al., (2020) Oteyola et al., (2021); Abubakar (2021) where it was found that teachers and students have a favourable perception towards using WhatsApp and Telegram in the teaching-learning process. In the studies of Wiranegara and Hairi (2020); Aghajani and Adloo (2018) it has been verified that WhatsApp and Telegram application provides us with immediate feedback. Aburezeq and Ishtaiwa (2013) and Durgungoz and Durgungoz (2021) concluded that WhatsApp and Telegram are effective tools for interaction between students and teachers. Hamad (2017) and Singh et al., (2020) remarked that using WhatsApp and Telegram in the teaching-learning process enhances students' learning, and retention (Kufre & Abe, 2017; Ashiyan & Salehi, 2016), communication skills (Kufre & Abe, 2017) and efficacious way of interacting with colleagues and peers (Shahkat Ali & Kootbodien, 2017). The present study found that the majority of teachers and students believed that although these applications are an effective tool in the education process, still there is a chance that they might distract students from the learning content. This is supported by the studies of Kushwaha and Jhawar (2018) Yeboah and Ewur (2014), where teachers and students felt that WhatsApp and Telegram could adversely affect their learning as students waste their time using it for other reasons as well. Maske et al. (2018) stated that messages such as wishes, prayers, and appreciation create discomfort and distraction among students and teachers while learning (as cited by Durgungoz and Durgungoz, 2021). A similar conclusion was drawn in the study of Cansoy (2017) Durgungoz and Durgungoz (2021), where it was asserted that social media applications develop a sense of belongingness among students and teachers, fulfilling their emotional needs. Even Derks, Fischer and Bos (2008) proclaimed that there is no such evidence that a digital media learning environment was less emotional than face-to-face classroom learning. These applications help in storing and sharing materials widely as supported by the findings of Munir, Erlinda and Afrinursalim (2021) and Mtega (2021). WhatsApp and Telegram have the potential to improve the quality of education as they integrate all forms of media (Alakloby, 2019).

Preference of the students and teachers toward the use of WhatsApp and Telegram in educational Context

The result of this study indicates that the majority of students and teachers mostly seem to prefer WhatsApp as an educational tool. Similar results have been addressed in the studies conducted by Reeves, Alkhalaf and Amasha (2019); Gasaymeh (2017) and Cetinkaya (2017). This is in line with the fact that WhatsApp is one of the most predominant social networking applications that enables users to send and share instant messages. Many researchers articulated that at present, WhatsApp has more advantages over other social networking applications employed by the education system. Gasaymeh (2017) reported that the integration of WhatsApp into education would enable students to access learning and educational material, assist

student-teacher and student-student interaction, and facilitate collaborative learning. Reeves, Alkhalaf and Amasha (2019) posited that the accessibility, usability and relative simplicity of WhatsApp in comparison to other applications make it the most favoured application among students and teachers. These studies strengthened our research findings that WhatsApp is the most preferred and effective delivery of information-sharing applications.

Educational implication and limitations of the study

Based on the research findings, the present study suggests that educational institutions should consider incorporating platforms such as WhatsApp, Telegram, and other socially mediated educational communication channels into their curriculum and pedagogical strategies. The favourable perception of teachers towards these platforms suggests that educational institutions should prioritize the implementation of professional development programmes to guide teachers on the most effective strategies for incorporating these applications into their teaching methods. Consequently, our study proposed the need to educate students on digital literacy, promote appropriate online etiquette (netiquette), and cultivate responsible use of messaging platforms within the educational context. Educational institutions need to ensure robust guidelines for both teachers and students regarding data sharing and communication on these platforms. It is mandatory to establish a harmonious equilibrium between technology and pedagogy to effectively shape significant learning experiences for students.

While this research provides valuable insights into perceptions and preferences regarding the use of WhatsApp and Telegram in educational settings, it also has some limitations. The methodology of this study was significantly impacted by the constraints imposed by the Covid-19 pandemic. As the study was conducted between the time frame of January-March 2021, the researchers had to collect responses from the sample using Google Forms, which limited the sample size. Additionally, this study had a limited focus on the use of WhatsApp and Telegram, overlooking other platforms that may be used or preferred in academic settings. Thirdly, the study specifically focuses on undergraduate students who are pursuing a Bachelor of Arts (BA) degree, as well as the teachers who are involved in teaching the Bachelor of Arts (BA) programme at the college level. As a result, the findings of this study may not be generalized to other sectors such as universities or different academic disciplines. These limitations highlight the need for additional, more thorough research to build on these findings and provide a broader perspective.

Conclusions

In this study, we attempted to examine students' and teachers' perceptions and preferences regarding the use of WhatsApp and Telegram as educational tools. The study's outcome proposes that WhatsApp and Telegram were perceived positively by the teachers for educational communication with their students. However, students have a positive perception of the use of WhatsApp and a neutral perception of Telegram. In view of preferences, both students and teachers prefer WhatsApp as an educational tool. Although from the above discussion of the data and the previous literature on the use of WhatsApp and Telegram, we can see the strengths of using this social networking application in enhancing academic learning expe-

riences, connecting with knowledge and information shared instantly by instructors and peers along with building rapport with students and teachers. In the coming years, due to the advent of the use of ICT in the 21st century, the influence of these applications in teaching-learning environments is welcomed substantially.

References

Abubakar, A. I. (2021). Perception on the Adoption of WhatsApp for Learning amongst University Students'. *International Journal of Research in STEM Education (IJRSE), 3* (2), 28-36. DOI: https://doi.org/10.31098/ijrse.v3i2.680

Aburezeq, I. M., & Ishtaiwa, F. F. (2013). The impact of whatsapp on interaction in an Arabic language teaching course. *International Journal of Arts & Sciences, 6*(3), 165-180.

Aghajani, M., & Adloo, M. (2018). The effect of online cooperative learning on students' writing skills and attitudes through telegram application. *International Journal of Instruction, 11* (3), 433-448. https://doi.org/10.12973/iji.2018.11330a

Alakrash, H. M., Razak, N. A., & Bustan, E. S. ().The effectiveness of employing telegram application in teaching vocabulary: A quasai experimental study. *Multicultural Education, 6*(1), 151-159. DOI:10.5281/zenodo.3905099

Alakloby, S. S. (2019). Using whatsapp as a training tool for Arabic language teachers. *International Journal of Education, Learning and Development, 7*(5), 92-96.

Ashiyan, Z., & Salehi, H. (2016). Impact of whatsapp on learning and retention of collocation knowledge among Iranian EFL learners. *Advances in Language and Literary Studies, 7*(5), 112-127. Doi:10.7575/aiac.alls.v.7n.5p.112

Bansal, T., & Joshi, D. (2014). A study of students' experiences of mobile learning. *Global Journal of Human-Social Science interdisciplinary, 14*(4), 26-33.

Cansoy, R. (2017).Teachers' professional development: The case of whatsapp. *Journal of Education and Learning, 6*(4), 285-293. http://doi.org/10.5539/jel.v6n4p285

Cetinkaya, L. (2017). The impact of whatsapp use on success in education process. *The International Review of Research in Open and Distributed Learning*, *18*(7), 59-74. https://doi.org/10.19173/irrodl.v18i7.3279

Chakravarti, A. (2021, February 25). *Government reveals stats on social media users*, WhatsApp leads while YouTube beats Facebook, Instagram. *India Today*. https://www.indiatoday.in/technology/news/story/government-reveals-stats-on-social-media-users-whatsapp-leads-while-youtube-beats-facebook-instagram-1773021-2021-02-25

Derks, D., Fischer, A. H., & Bos, A. E. R. (2008). The role of emotion in computer-mediated communication: A review. *Computers in Human Behavior, 24*(3), 766–785. https://doi.org/10.1016/j.chb.2007.04.004

Durgungoz, A., & Durgungoz, F. C. (2021). "We are much closer here": Exploring the use of WhatsApp as a learning environment in a secondary school mathematics class. *Learning Environments Research*. https://doi.org/10.1007/s10984-021-09371-0

Ebrahimpour, A., Rajabali, F., Yazdanfar, F., Azarbad, R., Nodeh, M. R., Siamian, H., & Vahedi, M. (2016). Social Network Sites as Educational Factors. *Acta informatica medica :Journal of the Society for Medical Informatics of Bosnia & Herzegovina, 24*(2), 134–138. https://doi.org/10.5455/aim.2016.24.134-138

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*, 17 (1), 1-10.

Gutierrez-Colon Plana, M., Gimeno, A., Appel, C., & Hopkins, J. E. (2013, July 10-13). *Improving learners' reading skills through instant short messages: A sample study using WhatsApp.* WorldCALL 2013 Global perspectives on Computer-Assisted Language Learning, Glasgow, 80-84.

Habibi, A., Mukminin, A., Riyanto, Y., Prasojo, L. D., Sulistiyo, U., Sofwan, M., & Saudagar, F. (2018). Building an online community: Student teachers' perceptions on the advantages of using social networking services in a teacher education program. *Turkish Online Journal of Distance Education-TOJDE 19*(1), 46-61.

Hamad, M. M. (2017). Using whatsapp to enhance students' learning of english language "experience to share". *Higher Education Studies,7* (4), 74-87. http://doi.org/10.5539/hes.v7n4p74

Kufre, A.P., & Abe, E.C. (2017). Effectiveness of Whatsapp as a collaborative tool for learning among undergraduate students in university of Uyo, Akwa Ibom state. *International Journal of Advanced Education and Research, 2*(5), 43-46.

Kushwaha, P. S. & Jhawar, N. (2018). Role of whatsapp as a teaching aid to enhance learning capabilities of management students. *Ushus-Journal of Business Management, 17* (1), 43-51.https://doi: 10.12725/ujbm.42.4

Lazzam-Khraiwish, A. A., Bataineh, A. M., & Alzyod, A. H. (2021). The effect of using whatsapp on the Jordanian 5th grade EFL students' speaking skill. *International Journal of Linguistics, 13*(4), 49. https://doi.org/10.5296/ijl.v13i4.18749

Mahdiuon, R., Salimi, G., & Raeisy, L. (2020). Effect of social media on academic engagement and performance: Perspective of graduate students. *Education and Information Technologies, 25*(4), 2427–2446. https://doi.org/10.1007/s10639-019-10032-2

Maske, S. S., Kamble, P. H., Kataria, S. K., Raichandani, L., & Dhankar, R. (2018). Feasibility, effectiveness, and students' attitude toward using WhatsApp in histology teaching and learning. *Journal of education and health promotion*, *7* (158). https://doi.org/10.4103/jehp.jehp_30_18

Mtega, W. P. (2021). Using whatsApp messenger for improving learners' engagement in teaching and learning: A case of undergraduate students at the Sokoine University of Agriculture, Tanzania. *Library Philosophy and Practice (e-journal),* 4809.

Munir, S., Erlinda, R., Afrinursalim, H. (2021). Students' views on the use of whatsapp during covid-19 pandemic: A study at IAIN Batusangkar. *Indonesian Journal of English Language Teaching and Applied Linguistics, 5*(2), 323-334. DOI: http://dx.doi.org/10.21093 /ijeltal.v5i2.740

Naidoo, J., & Kopung, K. J. (2016). Exploring the use of whatsapp in mathematics learning: A case study. *J Communication, 7*(2), 266-273.

Nitzal, D. & Roman, D. N. (2016). WhatsApp messaging: Achievements and success in academia. *International Journal of Higher Education, 5*(4), 255-261.

Oteyola, T., Oyeniran, O., Awopetu, E., & Bello, I. (2021). Students' acceptance of whatsapp/telegram for online classes: Osun State, Nigeria as a Pilot. *International Journal of Education and Development using Information and Communication Technology (IJEDICT),17*(3), 97-109.

Prokopyev, M.S., Kostikova, N. A., Kuzin, Z. S., Ilina, T. S., & Tyagulskaya, L.A. (2021).The technology of using telegram messenger as an elearning tool. *Laplage em Revista (International),7*, 229-238. DOI: https://doi.org/10.24115/S2446-622020217Extra-C1007p.229-238

Reeves, A. J., Alkhalaf, S., & Amasha, M. A. (2019). WhatsApp as an educational support tool in a Saudi University. *International Journal of Advanced Computer Science and Applications(IJACSA), 10*(8), 394-401. DOI: 10.14569/IJACSA.2019.0100853

Sari, F. M. (2018, November 30- December 1). *Undergraduate students' attitudes to the implementation of whatsapp group as their learning media in the EFL classroom*. International Conference on English Language Teaching and Learning, University of Lampung.

Shahkat Ali, M. S., & Kootbodien, A. (2017). The effectiveness of *whatsapp* as an interpersonal communication medium among Abu Dhabi university students. *International Journal of Media, Journalism and Mass Communications,3*(1), 11-19. doi:dx.doi.org/10.20431/2454-9479.0301002

Singh, C. K. S., Singh, T. S. M., Abdullah, N. Y., Moneyam, S., Ismail, M. R., Ong, E. T., Karupayah, T., Chenderan, K., Singh, M. K. R., & Singh, J. K. S. (2020) Rethinking english language teaching through Telegram, Whatsapp, Google Classroom and Zoom. *Systematic Reviews in Pharmacy*, 11 (11), 45-54. doi:10.31838/srp.2020.11.9

Susilo, S., & Amirullah, G. ().Student perception of the utilization of whatsapp in biological learning. Turkish Journal of Computer and Mathematics Education, 12(14), 842 – 850.

Wiranegara, D. A., & Hairi, S. (2020). Conducting english learning activities by implementing telegram group class during covid-19 pandemic. *Journal of English for Academic and Specific Purposes, 3*(2), 104-114. DOI:10.18860/jeasp.v3i2.11122

Xodabande, I. (2017). The effectiveness of social media network telegram in teaching english language pronunciation to Iranian EFL learners. *Cogent Education, 4*(1). https://doi.org/10.1080/2331186x.2017.1347081

Yeboah, J., & Ewur, G. D. (2014). The impact of whatsapp messenger usage on students performance in tertiary institutions in Ghana. *Journal of Education and Practice, 5* (6), 157-164.