THE TECHNOLOGY OF USING TELEGRAM MESSENGER AS AN E-LEARNING TOOL

INTRODUCTION

During the coronavirus pandemic, e-learning technologies have proven to be the most suitable (KUSTONO, 2021). E-learning has become a tool without which the modern education system cannot function to the full (ALRUBAIE et al., 2020; ANING and BAHARUM, 2020). Messengers have become an inherent e-learning tool. A large number of teachers in their daily professional activities use messengers, as they enable prompt resolving various issues both with students and colleagues (ABDELRAHIM, 2021). According to Statista business data platform, WhatsApp with 2,000 million users became the most popular messenger in the world as of January 2021 by the number of active users per month. It is followed by Facebook Messenger with 1,300 million users, Weixin/WeChat with 1,213 million users, QQ with 617 million users, Telegram with 500 million of users (STATISTA, 2021a). In the Russian Federation, the picture looks different, but WhatsApp is also the most popular with its audience of 69 million, Viber ranks second with more than 37 million users, and Telegram is the third with about 23 million users (STATISTA, 2021b). The plot shows that the number of users is growing every year, both in the world and in the Russian Federation (Fig.1). Besides, the Telegram messenger is the fastest growing and most comprehensively functional. Like all other messengers, it offers all the standard functions and unique opportunities, such as bot using, wide opportunities for correspondence managing, stability, security, open source, loyal developer community and multiplatformity.

Fig.1. Telegram users

Source: Search data.

The study objective is to develop a technology for using the messenger as an e-education tool. The study focuses on examining messenger using opportunities in education, selecting the most excellent tool, and usage guidelines development.
LITERATURE REVIEW

Messenger using in e-education was studied by researchers listed below. For example, the problems of learning during the COVID-19 pandemic using WhatsApp messenger in South Africa were examined in (MOTAUNG & DUBE, 2020). The authors found that students had difficulty participating in online lessons due to insufficient access to technological devices, poor skills, and competencies in specialized tools utilizing (MOTAUNG & DUBE, 2020). Using two messengers, Moya Messenger App and WhatsApp, as tools to support student learning at an open and distance learning university in South Africa is reviewed (CHAKA & NKHOBO, 2020). The issues of transition to distance learning in the context of COVID-19 in the assessments of the teaching staff are considered in the paper (NEBORSKY, 2020). An overview and a model of the WhatsApp messenger’s educational pattern are provided in (COLEMAN, 2019). The assessment of student’s attitudes and perceptions to using Facebook Messenger in an online discussion forum in the context of literature teaching is analyzed in (FARHAN & YUSOFF, 2019).

The works by Barakhsanova E.A. (2017) and Vlasova E.Z. (2018) deem to be theoretical foundations of research in e-learning are. The effectiveness of virtual education using Telegram messenger compared to full-time teaching about the life quality of asthmatic students is considered in (FARAJI, 2020). Using the Learning Analytics tool that makes it easier for teachers to evaluate interaction with students in the Telegram messenger was regarded as a teamwork competence evaluation method in (CONDE, 2020). The use of chatbots as an online tutor in teaching students was considered (LEE, 2020). The chatbot works in the Telegram messenger has an authentication system and provides responses following various requests (schedule, score distribution for the current examination period, and so on).

The modernization of the existing online learning system called “Peer-Interaction Programming Learning System” to improve students’ interaction with colleagues by integration with the mobile instant messaging service is the focus of the paper (LAI, 2020). The possibility of using messengers as a way to exchange and expand knowledge about teaching and studying statistics is discussed in work (OLIVEIRA, 2020). The issue of distance learning in a hybrid model using WhatsApp messenger as a learning platform for students living in remote areas of Ghana who have problems accessing the Internet was examined in the article (KOOMSON, 2018). Students’ experience in improving the involvement and behavior in student-student and student-lecturer interaction using Internet messengers is considered in the study (UMAM, 2017). The problem of the administration system functioning for collecting information from students were touched upon in (SARI, 2020).

The main features of the Telegram messenger and the prospects for its development in higher education are considered in the paper by Gatulin, R.R. (2017). The relevant problem of traditional and e-learning combination (mixed learning) comprising a reasonable matching of offline and online technologies is considered in the article by Semenova, L.M. (2020). The study outlines the advantages, problems, and prospects of the mixed learning concept. The monograph by Vlasova, E.Z. is focused on e-learning. It presents the primary theoretical and practical information relevant to understanding the essence of e-learning and the practice of its use in the educational process (VLASOVA, 2019). Barakhsanova, E.A. highlights the issues of e-learning implementation in the context of innovative education development in the North-East of Russia (BARAKHSANOVA, 2018). The outcomes of the study revealed the need to build up educational and methodological support for e-learning implementation in Churapchinsky State Institute of Physical Culture and Sports. The prospects and problems of organizing online lessons and school distance learning features using telecommunications within the self-isolation period were considered in the paper by Barakhsanova, E.A. (2020). The issues of creating a voice assistant that can be used when creating chatbots are dealt with by Galkin, A.V. (2020).

Mammadova, N.R. (2019) examined the peculiarities of teaching foreign languages using interactive applications (Instagram, messengers) that affect the spatial perception of visual information (spatial intelligence), inclusiveness, and the element of a constant presence in the learning process. They identified specific problems that can affect the quality of the educational process. The experience of using social networks as a learning platform, the peculiarities of conducting a remote competition at the educational institution level using the
WhatsApp messenger was studied by Tereshkovets, N.V. (2018). The author claimed that conducting events arouse interest among students and contribute to expanding educational space. It facilitates creating an active environment, effective work arrangement on students’ meta subject skills formation. The analysis of skills development in mobile technology users in Ukraine, consumer interest, and education dynamics through mobile messengers are considered in the paper (BIRYUKOVA, 2019). Its author defines the education strategy and tactics, and the user becomes a consumer and an active subject of these technologies.

Teachers’ training for their activity in the digital world and developing productive strategies for integrating created innovations into the traditional educational process are considered in work (VLASOVA, 2020). The experience in organizing online training at M.K. Ammosov North-Eastern Federal University and revealing the academic progress of students using online courses in their studies are considered in the article (KORNILOV, 2019). Sorochnsky, M.A. believes the problems of teachers’ readiness to implement effective educational activities using e-learning in (SOROCHINSKY, 2018), where the main issues faced by teachers are identified resulting from an online survey. The problems of advantages and disadvantages of using LMS Moodle in the context of distance learning are considered by Nikolaev, A.M. (2020).

The transition to mixed education via the gradual introduction of its elements and resolving teachers’ current problems in preparing classroom and virtual activities are considered by Osipova, S.N. (2018). The practice of e-learning system establishment and development at primary multidisciplinary university-based e-learning is considered by Gafurova, N.V. (2018). The concept of a new approach to learning that enables students to adjust (transform) the learning process to their own academic needs, bearing in mind their preferences, desires, and capacities, is described by Pak, N.I. (2019). The transformation of the profile of the scientific specialty “Informatization of Education” is examined in the paper (NOSKOV, 2019). Chatbot types, the current condition of their development, and prospects for their use in the educational process are considered in the article by Kireeva, N. A. (2018). The authors assume that the mass support among developers of various social networks and messengers by providing their platforms for use is the answer to users’ desire to get a convenient interactive tool for monitoring, editing, and obtaining the required information. Finally, we would like to mention that studies on Telegram messenger use in education are scarce. They mainly deal with the opportunities of its use. In our research, we will show how to use the Telegram messenger more widely.

MATERIALS AND METHODS

The study was conducted from 2019 to 2021 in three stages. The research base of the study was M.K. Ammosov North-Eastern Federal University (NEFU).

- Stage 1 of the study was conducted in the 2019-2020 academic year, where the Telegram messenger was selected and groups of students and teachers who use it. The survey was conducted remotely via a mailing list. The survey was developed in Google Form and comprised 15 questions that referred both to particular messenger’s functions and the general messenger approach. Besides, the interview method was used with some respondents from various educational institutions where the possibility of using the Telegram messenger in education was discussed in conversation.

- Stage 2 of the study was conducted in the 2020-2021 academic year. A mini-course and guidelines were developed on using Telegram’s opportunities in e-learning. In addition, selected groups of students and teachers were trained.

- Stage 3 of the study was conducted in winter 2021, when the survey was conducted repeatedly. The guidelines were also reviewed to comprise the addition of new Telegram messenger’s features.

RESULTS

The experiment was participated by university employees and students: 15 teachers and 146 students from 5 University departments (Teacher Training Institute, Institute of Mathematics...
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and Information Science, Institute of Natural Sciences, Faculty of Road Construction, Faculty of History) (see Table 1).

**Table 1. Stage 1 participants' structure**

| NEFU Institutes and Faculties                      | University lecturers | Students |
|---------------------------------------------------|----------------------|----------|
| 1. Teacher Training Institute                     | 4                    | 38       |
| 2. Institute of Mathematics and Information Science | 4                    | 41       |
| 3. Institute of Natural Sciences                  | 2                    | 16       |
| 4. Faculty of Road Construction                    | 2                    | 17       |
| 5. Faculty of History                             | 3                    | 34       |
| 6. Total                                          | 15                   | 146      |

Source: Search data.

Stage 1 of the study was conducted in the 2019-2020 academic year. Telegram messenger was selected as more promising and providing more opportunities than other messengers. Groups of students and teachers who use the Telegram messenger were selected. Telegram messenger has obtained many features for working with groups, chatbots, information presentation, and communication over the last few years, but not all users can work with the new features of the messenger. In this regard, a survey was conducted to identify the abilities to use the advanced Telegram's features. The survey was conducted remotely via a mailing list. It was developed in Google Form and comprised questions related to messenger's functions.

The survey contained the following questions: "Do you use surveys and quizzes?" to which the respondents could answer "I use," "I heard," "I have no idea"; "Do you know how to create surveys and quizzes by yourself?", to which the respondents could answer "Yes," "No," "I want to learn how to create"; "Do you use chatbots?", "Do you use chatbots focused on education?", to which the respondents could answer "Yes," "No," "I want to learn how to create"; "How many Telegram channels are you subscribed to?", to which the respondents could answer "None," "1-5 channels", "From 5 to 10 channels", "More than ten"; "Do you use Telegram channel analytics?", to which the respondents could answer "Yes," "No," "What is it?"; "Do you use chatbots focused on education?", to which respondents could answer "Yes," "No," "What is it?"; "How many Telegram channels are you subscribed to?", to which the respondents could answer "None," "1-5 channels", "From 5 to 10 channels", "More than ten"; "Do you use Telegram channel analytics?", to which the respondents could answer "Yes," "No," "What is it?"; "Do you use chatbots focused on education?", to which respondents could answer "Yes," "No," "What is it?".

According to the data obtained from the survey, most respondents have heard or participated in quizzes and surveys in Telegram (78%). However, they cannot create such quizzes and surveys by themselves and would like to learn (81%). They use chatbots (83%) but do not know that there are chatbots focused on education. They are subscribed to 1-5 Telegram channels (89%) but do not use Telegram channel analytics (77%). Most respondents do not know how to create a discussion in a group (91%) and do not have the skills to work in Telegram publications services (78%) (Figure 2).
Figure 2. Survey results

Source: Search data.

The survey results conducted between NEFU students and staff set the task of developing a mini-course on using the opportunities of Telegram messenger as an e-learning tool.

Stage 2 of the study was conducted in the 2020-2021 academic year. A mini-course (Figure 3) was developed using Telegram’s opportunities in e-learning. The guidelines were created, and selected groups of students and teachers were trained. The practical training course was designed in mini-lectures in video format (posted in YouTube video hosting, with limited access via the link from the system). Each lecture covered the individual functionality of the messenger. The practical tasks were focused on using Telegram messenger. The training course materials were posted in NEFU E-Learning and Distance Learning System (yagu.s-vfu.ru).

Figure 3. The structure of the Training Course “Basics of using Telegram.”

Source: Search data.

Stage 3 of the study was conducted in winter 2021. Two groups of university students (the reference and experimental ones) were selected. Both groups were asked to explore issues related to creating discussion groups, creating and distributing surveys and quizzes in Telegram, creating, editing, and publishing articles. The reference group studied these issues independently. The experimental group was trained using the developed course. The final tasks detected that the experimental group scored a higher result than the reference group. It confirms the relevance of the chosen training method (Figure 4). 76% of students learned how to use Telegram messenger as an e-learning tool. All students created their discussion groups,
learned how to complete surveys and quizzes, and to create texts in the Telegraph publication service. The guidelines were also reviewed to comprise the new added Telegram messenger's features. For example, the opportunities of voice chats were expanded, and an analog of currently popular Clubhouse was obtained.

**Figure 4.** Telegram using skills by final results

Source: Search data.

**DISCUSSION**

We conducted a survey and interviews among university employees and students, assessed the level of their knowledge of Telegram messenger’s features, and detected knowledge gaps among users. We have developed the guidelines for using the messenger in education. The general guidelines comprised the following advice.

If you subscribe to a lot of groups, bots or channels, and their notifications interfere with you, use the "Mute notifications" command, and hide your phone number from others. To do it, you go to the security settings; change the application background ("Setting – Chat Background").

If you have too many contacts, people, bots, groups and channels, use "Plus Messenger" feature. It will help you to split your contacts into certain groups set by you.

You can create your own data storage. To do it, find yourself and use a chat with yourself, the files that you send to yourself will be available to you at any time and from any of your devices; use more hashtags, so you will quickly find information.

The guidelines related to education read as follows. Using the Telegram Analytics project, learn channel analytics and search for educational content.

Write articles and publications in the Telegraph created for publishing various content based on the markdown web language. It enables you to make your texts lightweight. The size of the published material can be unlimited, so the tool is an optimal solution for creating longreads. Attach "Discussions" in the groups created by you, so you can easily clear the group from large message volumes. All discussions will run only under the news posted in the group by you. Use chatbots. There are ready-made library bots, spell-checking bots, dictionary bots, translator bots, and others.

**CONCLUSION**

The study examined the world and Russian experience on messenger using in educational context, the ways the messengers complement the e-education concept, and the opportunities comprised in modern messengers. The Telegram messenger was selected, as it currently has the widest functionality and the most tools. It is independent of states and transatlantic corporations that currently control the IT sector.

The guidelines were developed for using the Telegram messenger as an e-learning tool. The messenger n itself will not replace the distance learning systems and the traditional education.
The messenger is only a tool for quick communication and control. The fact that it has a higher functionality than other messengers makes it more attractive for education.

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The technology of using telegram messenger as an e-learning tool

A tecnologia de usar o telegrama messenger como ferramenta de e-learning

La tecnología de usar telegram messenger como una herramienta de aprendizaje en línea

Resumo
Este objetivo do artigo é fornecer diretrizes metodológicas sobre o Telegram messenger utilizando por participantes do processo educacional no contexto da e-learning. A análise de problemas é focada no exame de oportunidades para ferramentas e tecnologias de mensageiros na interação com os usuários. Os procedimentos do messenger utilizados pelos professores como parte da e-learning são sistematizados. A tendência para o mensageiro usar a expansão como ferramenta para comunicação rápida e monitoramento da execução de tarefas no e-learning é descrita. Diretrizes metodológicas para os professores sobre o uso do Telegram para melhorar a eficiência da organização educacional na e-learning foram desenvolvidas. A importância teórica dos resultados reside em resumir a experiência russa e estrangeira em mensagens do messenger para fins de e-learning. Justifica-se a necessidade de uso de mensageiros no arranjo de atividades educacionais. A eficácia de seu uso é bem fundamentada.

Palavras-chave: E-learning. Messenger. Telegram. Organização de processos educacionais.

Abstract
This article objective is providing methodological guidelines on Telegram messenger using by educational process participants in the context of e-learning. The problem analysis is focused on examination of opportunities for messenger tools and technologies in interacting with users. The procedures of messenger using by teachers as part of e-learning are systematized. The trend for messenger using expansion as a tool for fast communication and monitoring task execution in e-learning is described. Methodological guidelines for teachers on using Telegram messenger for improving the educational organization efficiency in e-learning have been developed. The theoretical significance of the results lies in summarizing Russian and foreign experience in messenger rising for e-learning purposes. The necessity of using messengers in educational activity arrangement is justified. The effectiveness of their use is well-grounded.

Keywords: E-learning. Messengers. Telegram. Educational process organization.

Resumen
Este objetivo del artículo es proporcionar directrices metodológicas sobre Telegram messenger utilizando por los participantes del proceso educativo en el contexto del e-learning. El análisis de problemas se centra en el examen de las oportunidades para las herramientas y tecnologías de mensajería en la interacción con los usuarios. Los procedimientos de mensajería que utilizan los profesores como parte del e-learning están sistematizados. Se describe la tendencia de la mensajería a utilizar la expansión como herramienta para la comunicación rápida y el seguimiento de la ejecución de tareas en el aprendizaje electrónico. Se han elaborado directrices metodológicas para los profesores sobre el uso de Telegram messenger para mejorar la eficiencia de la organización educativa en el aprendizaje electrónico. El significado teórico de los resultados radica en resumir la experiencia rusa y extranjera de mensajería con fines de aprendizaje electrónico. La necesidad de utilizar mensajeros en el arreglo educativo de la actividad se justifica. La efectividad de su uso está bien fundamentada.

Palabras-clave: E-learning. Messenger. Telegram. Organización de procesos educativos.