USE OF BOT-TECHNOLOGIES FOR EDUCATIONAL COMMUNICATION AT THE UNIVERSITY

Nataliia Morze
Borys Grinchenko Kyiv University
18/2 Bulvarno-Kudriavska Str, Kyiv, Ukraine, 04053
n.morze@kubg.edu.ua

Oksana Buinytska, Liliia Varchenko-Trotsenko
Borys Grinchenko Kyiv University
13b Marshala Tymoshenka Str, Kyiv, Ukraine, 04212
o.buinytska@kubg.edu.ua, l.varchenko@kubg.edu.ua

Abstract: *In the article the authors analysed the conditions and benefits of using chat bots in the messengers to provide effective educational communication. They defined the most popular instant messengers used by modern student, analyzed the tools provided in the messengers, in particular the possibility of creating special programs simulating human activities - chat bots. Special attention is given to determining the ways of using bots in the educational process. The article also describes the technology of implementation of the Smarsy chat bot for communication between participants of the educational process at the Borys Grinchenko Kyiv.*

Keywords: messenger; chat bot; communication; collaboration; Smarsy

INTRODUCTION

In modern society, information and communication technologies are actively used in all spheres of human life, including education. They are catalyst for change that affects the educational system, from content to its forms and methods. It is their development that allowed us to return to the development of new educational technologies based on efficient electronic communications in real time and integrated data exchange systems. Electronic communications combines people through the Internet with the help of such services as e-mail, social networks, blogs, wikis, etc. It allows users to communicate and solve common tasks at any time from any place, it allows to study, to receive relevant information, to make common, well-considered decisions in real time. That is why the modern educational environment of the modern university should include a component that will provide electronic communication among all participants in the educational process.

The purpose of the article: is to investigate the state and benefits of using Chat Bots in the media for effective education communication. To achieve the goal, the following tasks were solved: to identify the most popular media among students through a survey; to analyze the toolkit provided in the chatters to create chat bots, in particular Telegram; to determine how to use bots in the educational process (based on Telegram messenger); to describe implementation of Smarsy technology for communication among participants in the BGKU educational process.

1. FORMS OF ELECTRONIC COMMUNICATION

The most common forms of electronic communication in real time include: videoconferencing; online meetings; web forums; instant messages; chats; wiki social networks. Their number and variety are constantly changing.

As e-communication is gaining in importance and is becoming one of the main types of communication in the modern world, special attention is paid to messengers with support for chat-bots - programs simulating human activities.

The rapid development of technology has overpowered the market for software products and mobile applications used for communication. Experience has shown that users are reluctant to receive news about the installation or use of new special applications and mobile applications. According to ComScore, 80% of their time users spend making use of only the main applications. Against this background, the messenger segment for e-communications continues to grow strongly ("Bots: what it is, how they work and why we need to understand them", 2016). In 2016, the cumulative audience of the most popular messengers overtook the most popular social networks. As a result of the research it became obvious that it is easier to get to the user with the help of the program that he has installed and opens every day than to convince him of the need to work with a new application.

This means that it is advisable for application developers to create custom applications for well-known programs that will enable them to expand their functionality. So in such a way new technologies appear, one of which is the bots.

2. CHAT-BOT – THE PART OF MODERN COMMUNICATION TECHNOLOGIES

Among all the latest developments and inventions such as the Internet of things, big data, electric cars, cloud technologies, 3D printing, etc., the most trendy and popular are chat bots.

Robot, or bot (English - bot, abbreviated in Czech - robot) is a special program that performs automatically and / or in a given schedule of any action through interfaces intended for people ("Robot (program)", 2017).

Usually, bots are used for monotonous and repetitive work, with the highest possible speed (obviously, much higher than human capabilities).

Over 170 million Facebook accounts and 48 million Twitter accounts are bots. Such data is reported by researchers from the University of Southern California and the University of Indiana, as well as The Huffington Post ("Modern IT technologies for business: why companies need bots and clouds", 2017). Bots become an important and noticeable part of everyday life. However, their use is at an early stage. In fact, the bot is an interlocutor in a messenger that automatically responds on request. It interacts with external services and applications and, if necessary, can do it on a specific schedule. Instead of searching for a long time on Google or installing dozens of apps on your smartphone, you can do the same with several commands in the messenger.

Bots are also used in situations where the best response is required in comparison with human capabilities (for example, bots for games, bots for online auctions, etc.) Sometimes they are used for simulating human actions (for example, bots for chats, etc.).

Chat-bots can give quite adequate answers to questions formulated in the correct Ukrainian language. Such bots are often used to report weather forecasts, results of sports events, exchange rates, etc.
The term "ChatBot" was introduced by Michael Moldin (creator of Verbot, Julia) in 1994 to describe the spoken-word program ("Hello, Bot! Are Chat Bots – The Next Generation of Applications?", 2016).

The main advantages of using chat bots are:

1. It is much easier to install bots than mobile apps. To install the bot, you just have to find it in the messenger and start the correspondence. Bots are a set of automatic messages.

2. Ease distribution. Bots can be distributed through links and through other bots. In the case of Slack messenger, any member of the working group can add the bot so that become available to the all team.

3. High-quality mobile applications are expensive in development and support. Creating the program suppose the presence of qualified developers (or even teams) for Android and iOS, requires tests, debugging, applications in app stores. In the case of bots, they are easily created and added to ready-made messengers.

4. There is a huge number of situations in which the mobile application is unjustified. Almost instant start of the bot opens many new usage scenarios. Bots are used in cases where you do not need to create extra applications.

5. Bots can manage searching requests, data stored in the cloud. Transferring computations to the cloud reduces the load on the user.

6. Bots are adapted. Chats are a "natural environment" for bots, so they can easily live and work in a live conversation, as is done by personal assistants (Siri, Google Now), in auto-navigators, smart watches, emails, push messages, and more. .

7. The use of chat bots creates an image of a structure that follows modern technologies.

8. The use of chat bots does not require a complex programming knowledge. If you want to learn how to program a chat bot - quite simply, you do not need to know the programming languages. It is enough to determine in which messenger you need to create a bot and what it should do.

9. Chat bots are not artificial intelligence. This is another step towards the use of artificial intelligence technologies.

3. USE OF CHAT-BOTS IN MESSENGERS

By exploring the current state of the use of chat bots in the messengers it can be concluded that chat bots are very universal means capable of solving various tasks from communication to counselling, from information services to voting, from instant surveys to ordering educational content that will allow participants in the educational process to make decisions in time.

To determine the ways of using chat bots in the educational process at the beginning of the study, a target audience was identified - users aged from 17 to 21 years. To determine the types of messengers most used by students, a survey was conducted. Based on the student survey results (the number of students who answered more than 1000 questions), they determined that they are users of such messengers: Viber, Facebook Messenger, Telegram and WhatsApp (Figure 1).
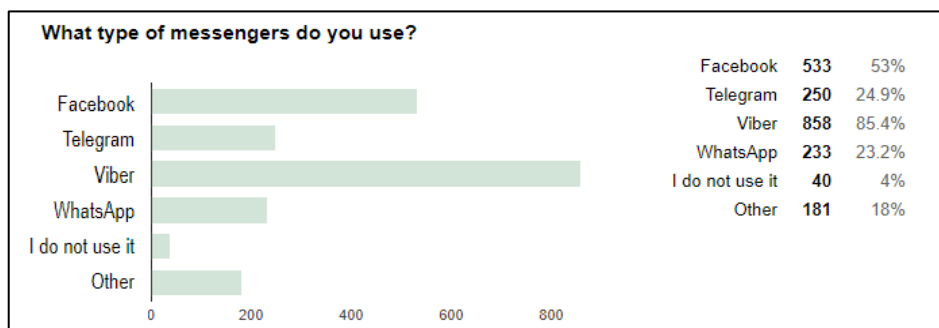

Figure 1. Student Survey Results

Source: Own work

In order to identify the tool provided by popular messengers to create chat bots, a detailed analysis of not only the functionality of messengers was conducted, but also considered examples of existing chat bots and the current state of the tools for their development.

Messenger Viber does not have open tools for developing chat bots. Viber Ari is only available to users who sign up for Public Accounts, which are only government agencies, brands or businesses, public organizations, or public entities.

The Facebook Bot Engine also looks attractive for Messenger's chat bots developers, because it provides wide range of user interfaces for bots and has detailed documentation.

Telegram is a messenger that allows you to exchange text and multimedia files and has bots - special accounts that can automatically process and send messages. Boots can virtually do any tasks that an average user of the Telegram account with online services does. Bots can teach, entertain, search, broadcast, remind, connect and connect to the Internet of things. In essence, bots are a user-friendly interface for working with a variety of web services. To use bots, you only need an account in Telegram. For users, interacting with them looks like chatting in chat, the only difference is that the other end is not a person, but a program with elements of artificial intelligence.

"Telegram Bot can be programmed for a specific purpose, as to search for videos, pictures, to read RSS feeds, and even to interact with other Telegram Bots. The Telegram Bot API is a functions set to support the creation of the Telegram Bot dynamic through programming languages, such as Phyton, Java, C/C++. The Telegram Bot dynamic specifies the interaction rules with person users and other Telegram Bots, which are machine users" (Juan Carlos de Oliveira; Danilo Henrique Santos; Mário Popolin Neto (2016). Chatting with Arduino platform through Telegram Bot. 2016 IEEE International Symposium on Consumer Electronics (ISCE), 2016, P. 131 – 132.)

That is why the Telegram messenger was chosen during the research for the implementation Bot Technologies at the University.

The advantages of the Telegram Messenger include:

- Cloud storage of files;
- File transfer (rar, pdf, mp3, jpeg) up to 1.5 GB;
- Ability to synchronize with different devices;
- Maximum number of interlocutors in chat - 5000;
- Maximum speed of message arrival;
- The highest level of security among messengers;
- Self-destruct messages (deleted after receiving by the recipient);
- The presence of bots;
- Presence of thematic channels.

4. CHAT BOTS IN EDUCATIONAL INSTITUTIONS

The survey conducted indicates the following reasons for low student activity when using ICT:

– The absence of a living teacher in the face of whom you feel responsible.

– The lack of teammates, along with which you feel the spirit of competition.

– Lack of hard schedule, praise, reproach - nothing but your own motivation to reach the end.

As can be seen from the statistics, for 90% of the respondents, a teacher is needed to help them grasp the knowledge gained. It can be artificial intelligence.

Prototypes of chat-bot applications are in demand on the market of educational services, in particular

Artificial intelligence will allow you to introduce an individual approach to each student. Educational programs will not just be textbooks and tests, with a new interface - they will become real teachers and the more students will participate in a similar educational system, the more "smarter" it will be. Receiving feedback from students in terms of the number of solved tasks and their progress, the system will be able to adjust the previously applied approach, and over time, it will become a "perfect teacher", which can be given beginner at the entrance, and at the exit to get a professional.

For solving the urgent tasks of the educational branch: providing assistance to students who learn remotely automated surveys when attaching the studied material, receiving feedback from users about the quality of educational services, etc.

The most useful bots for solving educational tasks are:

1. @AndyRobot is a chat bot which will unobtrusively help you learn English from scratch or pull it to the required level. AndyRobot can conduct serious conversations "in life", support small talk, pick up tests and games for users.

2. @ucheba_bot - A bot which can answer questions to participate in the quiz to pick up an IQ test to give general knowledge on various sciences. It is actually a teacher with a lot of different functions. According to the feedback, it is highly appreciated by students who are studying IT-technologies: the bot helps to save on textbooks, provides the necessary information and sets up really important questions.

3. @Wikipedia_voice_bot - Wikipedia's voice search box bot. You can request the necessary information without distracting from your daily activities.

4. @YTranslateBot is a Yandex-based bot translator. "Understands" phrases and translates them entirely, unlike many other bots-dictionaries.

5. @pronunciationbot - the bot that converts the received text into an audio message or sends transcription of words on the international phonetic alphabet in order to teach the correct pronunciation.

6. @stepicbot is a bot that helps you find open online courses and educational materials on the stepik.org platform: from lessons on rational thinking to advanced C / C ++.

In addition, there are chat bots for the formation of the curriculum. Today, the educational process actively applies a personalized approach that educates a holistic person and a highly skilled specialist in a particular industry. Therefore, creating a curriculum should take into account the interests of students and the solution of educational tasks without the exchange of contact data (telephone numbers, addresses of mailboxes or accounts in social networks), as well as without creating groups in messengers or networks. In addition, Smarsy's personal assistant will help you quickly automate a poll or vote without human intervention, so fake results, double voting and other tricks in this case are not possible. Smarsy's personal assistant also provides quick and easy access to any e-learning or administrative information (schedules, news, announcements, etc.) directly in your favorite messenger, without the need to download websites and remember the logins and passwords.

Borys Grinchenko Kyiv University began using these innovative technologies for the good of its students, faculty and administration.

To this end, a plan has been developed for the experimental introduction of bot technology, their features. The content of the course is adapted to the individual pace of learning so that each student learns in a comfortable rhythm. Chatting and AI-algorithms help with collecting and analyzing data for each student.

The University of Dickinson in Australia, Victoria is developing an Intelligent Chat Boat that will respond to students' questions about campus quality. IBM's Virtual Assistant for Artificial Intelligence will help you find a lecture hall, apply for training, find a parking space and much more.

The personal assistant in education, which operates on the basis of modern bot technology known messengers (Telegram, Viber, Facebook Messenger) is a Smarsy chat-bot. Its main goal is to provide students, faculty and administration of the University with the opportunity to quickly communicate with each other for the purpose (Figure 2).
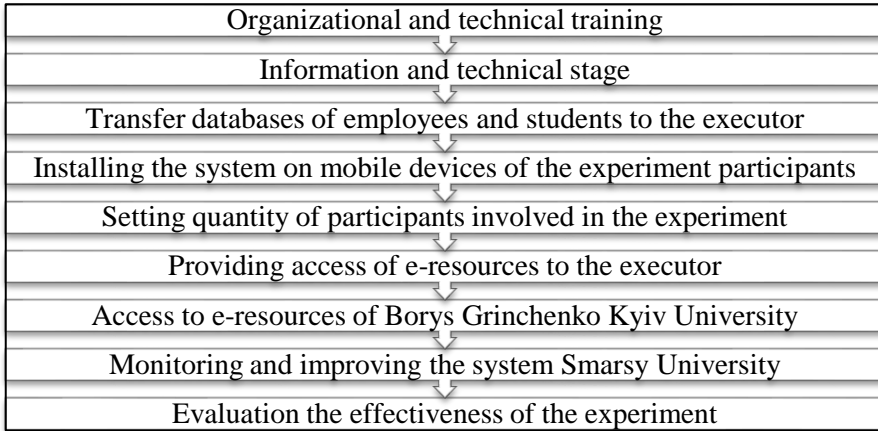
Organizational and technical training
Information and technical stage
Transfer databases of employees and students to the executor
Installing the system on mobile devices of the experiment participants
Setting quantity of participants involved in the experiment
Providing access of e-resources to the executor
Access to e-resources of Borys Grinchenko Kyiv University
Monitoring and improving the system Smarsy University
Evaluation the effectiveness of the experiment

Figure 2. Plan for the experimental introduction of bot-technology
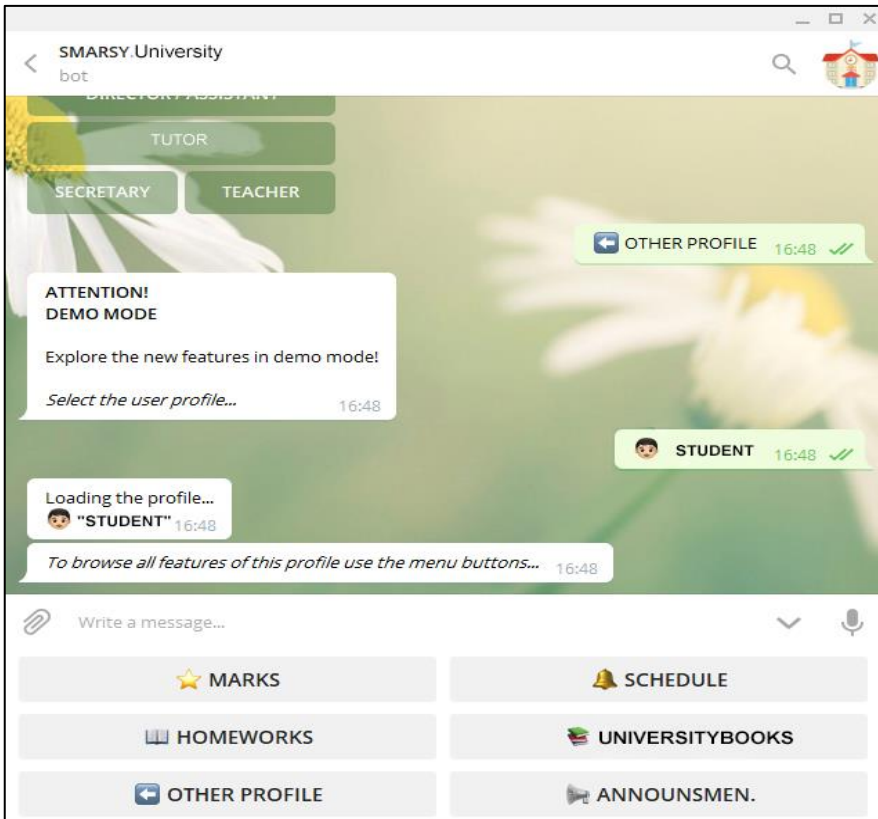*Source: Own work*

Figure 3. The role of the student
Source: Own work

Each participant can choose the appropriate role student, parents or school staff (director assistant, class teacher, secretary teacher). For each of the specified roles,

the chat bot has functions and features defined by the administration. So for the student, the appearance of the chat bot is presented in Figure 3, for the manager – Figure 4.
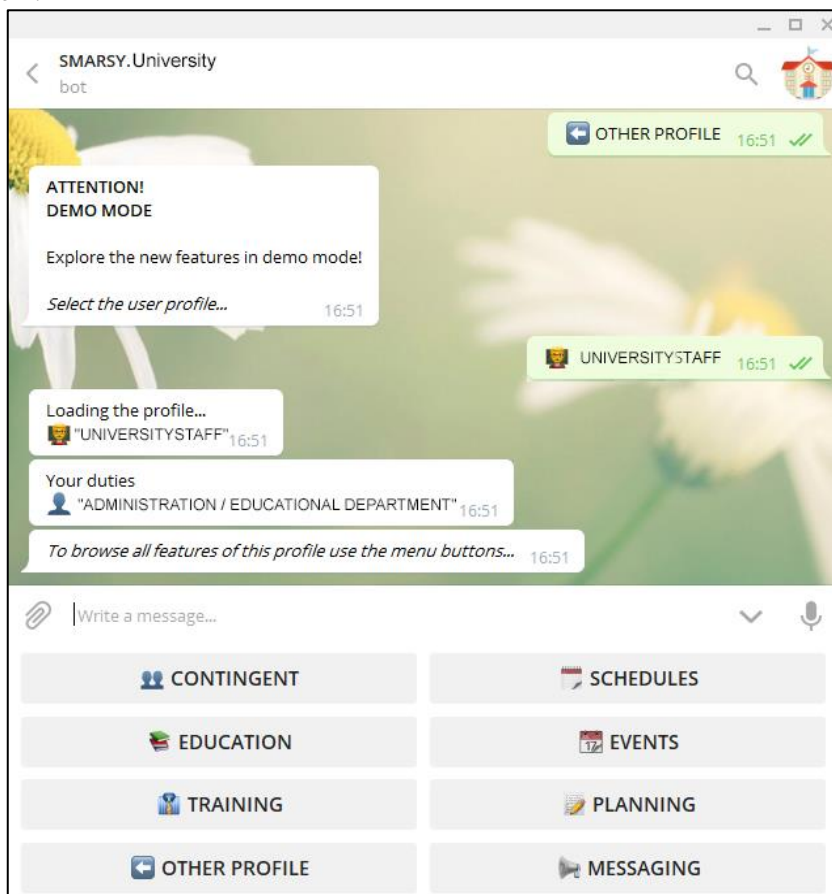

Figure 4. The role of the director
Source: Own work

At the initial stage, it is planned only to create a chat bot for organizational and informational tasks, which will allow students not only to review the schedule of studies, tasks, assessments, and in the future, taking into account the individual needs to build their own trajectory of training. For the administration, we expect to help chat-bot not only in alerts and questionnaires, but also in planning, contingent formation, scheduling of classes, and, accordingly, in making up-to-date correct decisions.

CONCLUSION

An integral part of the informational educational environment of the modern university is the electronic communication between all participants of the educational process in real-time and integrated data exchange systems. There aren't

a lot of willing staff who want to install new software on their own mobile devices, then you need to use those applications that are already installed. After analyzing what messengers students use and after studying their possibilities, our decision was to use Telegram and to create a personal learning assistant - the Smarsy chat bot, which aims to provide students, faculty and administration of the University with the ability to ensure fast communication with each other, for solving educational problems, without contact information exchange, without creating groups in messengers or networks. The Smarsy feature is to help solve information and organizational tasks – is the ability to automatic survey or voting without human intervention, access to any educational or administrative information without the need to download websites and remember the logins and passwords. One role - a student, a teacher, an administrator, is given to each participant and it is given the corresponding levels of access to the resources of the informational educational environment. Upgrading and developing Smarsy, we are waiting for the chat-bot in the construction of personal trajectories of student training, planning, contingent formation, scheduling of classes, and, accordingly, making the right decisions right.

ACKNOWLEDGMENTS

REFERENCES

"Chat-bots will teach your children" – column by Michael Yang, [online] at https://rb.ru/opinion/bot-study, (accessed 4 September 2017)

Bots: what it is, how they work and why we need to understand them, [online] at https://te-st.ru/2016/06/08/chatbots/, (accessed 30 August 2017)

de Oliveira J. C., Santos D. H., Neto M. P., 2016: *Chatting with Arduino platform through Telegram Bot.* 2016 IEEE International Symposium on Consumer Electronics (ISCE), 2016, P. 131 – 132. Electronic ISSN: 2159-1423. DOI: 10.1109/ISCE.2016.7797406

Hello, Bot! Are Chat Bots – The Next Generation of Applications? [online] at https://habrahabr.ru/company/microsoft/blog/281459/, (accessed 3 September 2017)

Modern IT technologies for business: why companies need bots and clouds, [online] at https://www.epravda.com.ua/rus/publications/2017/03/20/622844/, (accessed 25 August 2017)

Robot (program), [online] at https://uk.wikipedia.org/wiki/Робот_(програма), (accessed 26 August 2017)