

JEL Classification: M12, M15, M54, M59
DOI: 10.46361/2449-2604.8.2.2021.82-91

**GENERAL ANALYSIS USING OF DIGITAL
COMMUNICATION TOOLS BY STUDENTS IN
DISTANCE LEARNING, CAUSED OF CORONAVIRUS**

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The coronavirus pandemic dramatically changed the daily rhythm of our lives globally in a very short time. All the organizations and people have had to adapt to new ways of life and many new rules.

Covid-19 has also posed new challenges to information technology, and if the pandemic has pushed back some sectors of the economy and business, we cannot say the same about information technology. Information technology has so far evolved rapidly, and due to the pandemic, blocking and the inclusion of more and more users and services online has led to their unprecedented rapid development and the opening of numerous opportunities in the IT industry.

In the article there is discussed the general analysis of using of digital communication technologies by students in distance learning. In particular, it analyzes which of the modern digital media tools students prefer, what they consider to be the biggest advantages and disadvantages of online mode, and in general, their attitude towards teaching and working online.

Edited by:

June, 2021

Reviewed by:

July, 2021

Keywords: *Distance learning, Information technology, research, analysis, students*

JEL Classification: M12, M15, M54, M59
DOI: 10.46361/2449-2604.8.2.2021.82-91

სტუდენტთა მიერ ციფრულ საკომუნიკაციო საშუალებათა გამოყენების ზოგადი ანალიზი კორონავირუსის გამო დისტანციური სწავლის დროს

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შემოსულია რედაქციში:

ივნისი, 2021

რეცენზირებულია:

ივლისი, 2021

კორონავირუსულმა პანდემიამ მოულოდნელად მკვეთრად შეცვალა ჩვენი ცხოვრების ყოველდღიური რიტმი. გლობალური მასშტაბით მოუწიათ მოსახლეობასა და ორგანიზაციებს ცხოვრების ახალ ხერხებზე მორგება და ბევრ ახალ წესთან შეგუება.

კოვიდ-19-მა ახალი გამოწვევების წინაშე დააყენა ინფორმაციული ტექნოლოგიებიც, და თუ პანდემიამ უკან დასწია ეკონომიკის და ბიზნესის ზოგიერთი დარგი, ამას ვერ ვიტყვით ინფორმაციულ ტექნოლოგიებზე. ინფორმაციული ტექნოლოგიები აქამდეც მართალია სწრაფი ევოლუციით გამოირჩეოდნენ, მაგრამ პანდემიის გამო ბლოკირებამ და ონ-ლაინ რეჟიმში სულ უფრო მეტი მომხმარებლებებისა და სერვისების ჩართვამ მათი არნახულად სწრაფი ტემპით განვითარება და IT ინდუსტრიაში უამრავი შესაძლებლობის გახსნა გამოიწვია.

სტატიაში მოკლედაა დახასიათებული დისტანციური სწავლის დროს ყველაზე ხშირად გამოყენებული საკომუნიკაციო საშუალებები, და მოყვანილია კორონავირუსის გამო დისტანციურ სწავლებაზე გადასვლისას სტუდენტთა მიერ ციფრულ საკომუნიკაციო საშუალებათა გამოყენების ზოგადი ანალიზი.

სტატიის კვლევის შედეგი გვიჩვენებს თუ როგორი დამოკიდებულება გააჩნიათ სამივე საფეხურის სტუდენტებს (ბაკალავრებს, მაგისტრებს, დოქტორანტებს) ზოგადად ონლაინ რეჟიმში სწავლებისა და მუშაობისადმი; რას მიიჩნევენ ისინი ონლაინ რეჟიმის ყველაზე დიდ უპირატესობად და ყველაზე დიდ ნაკლოვანებად; თანამედროვე ციფრული საკომუნიკაციო საშუალებებიდან კერძოდ რომელს ანიჭებენ უპირატესობას დისტანციური სწავლისას; ზოგად ანალიზთან ერთად ჩატარებულია აგრეთვე კვლევა სქესი და სწავლის საფეხური ახდენს თუ არა გავლენას სტუდენტთა მიერ ციფრული საკომუნიკაციო საშუალების არჩევანზე. ამ მხრივ ნაშრომში დასმულია ჰიპოთეზები, რომელთა შემოწმებაც რეალიზებულია დისკურსიული ანალიზის საშუალებით.

საკვანძო სიტყვები: დისტანციური სწავლა, ინფორმაციული ტექნოლოგია, კვლევა, ანალიზი, სტუდენტები.

INTRODUCTION

For Georgia, like for any other country, reproduction of human capital, which responds to the modern challenges of the innovative economy is the main condition for economic growth. High unemployment, which causes quite negative economic and social consequences in the daily life of any country, represents the most important barrier to full utilization of human capital [1]. In the last few months, due to the new pandemic, numerous software packages and applications have been created, which were intended not only for the medical field, but also for isolated and non-isolated people, some applications, video streaming websites (Netflix and Youtube), virtual tours and more allows us to relax, which we need for some time to become more productive while constantly working online.

Today, many developed countries pay great attention to the development of the digital economy, in particular the blockchain technology, there by adopting new legislative acts and state programs, gradually introducing digitalization in all areas of the economy and creating infrastructure for the development of the digital economy [2]. In today's world, after closing so many businesses and decreasing jobs, emotional stability of the people get worse [3]. for maintain a normal mental environment, people need to keep in touch with each other, which was made possible by the infrastructure and software provided by information technology during the pandemic, with video and audio calls allowing people to see and hear regardless of their physical location. During this pandemic, for example, one of the most entertaining video call apps – Houseparty gained popularity; it allows connection with many acquaintances with whom you have not had a communication for a long time: the app will notify you when they are online and available for video

chat. They have meet each other rarely, which decreases probability of appearing stressors and develop conflict [4].

The need of contacting with each other is also confirmed by the students in below researching.

It is clear that information technology has played a huge role in overcoming the problems caused by this global pandemic and maintaining a normal feeling. Furthermore, it has become a part of our daily lives due to our duties or involvement in the educational process. In order to accelerate the innovative development of our country and improve the international competitiveness of Georgia, in the future, the state and private investments must be directed towards the development of human capital [5].

In 2020 the transition of learning processes to online and performing job duties from home has led to an increase in Internet services from 40% to 100%, using video conferencing services like Zoom has increased ten times and more [6].

The other side is working students. There are frequent cases when undergraduate students have 2 years and sometimes more than 2 years of work experience [7]. Internet usage by them is increased as well.

Choosing the right technology for remote learning has played a huge role in ensuring non-problematic online work. Education was one of the areas in which activities changed dramatically due to the coronavirus with the remarkable growth of e-learning.

Education is an area where educational institutions have shifted to video conferencing platforms such as Zoom and Google Meet. In order to run the learning process smoothly, we found alternative ways of learning through digital technologies and online educational resources.

Video call applications have played a particularly important role in ensuring communication and working with group members without obstacles.

The 8 best free video calling apps were released during this period [8].

Here is a brief overview of these apps by their popularity:

1. Zoom- It is a very convenient and universal application, which can be installed on both PC and mobile, which makes it more popular. Zoom allows included members to share their screens with each other, use the Chat-box, turn on / off video / audio. Due to its practical and convenient use, Zoom is currently used by almost everyone for a variety of purposes: video or just online meetings, tutorials, webinars, video conferencing, and more. The initial use of Zoom app is free with a capacity of 100 users. For more than 3 users, working time of Zoom is 40 minutes fir max, so universities and organizations purchase paid versions for incessant operations.
2. Apple Facetime – The best app, but only for Apple users, it works with both MacOS and iOS and it can include maximum 32 users.
3. Google Duo - This application can be used with PC with windows and macOS, as well as Android mobile phones. Google Duo has a wide range and can accommodate up to 12 users.
4. Facebook Messenger - As all know, It can be used on both mobile and PC with and without Facebook. Messenger allows up to 50 users to make video calls simultaneously, in addition to text messaging service, it also has the ability to send video, audio and images.
5. Skype - best for professional calls, offers voice and video calling options, along with text messaging service, can also send video, audio and pictures. It also has the ability to share the screen and translate in real time in their “chat” function. Available for both Windows and macOS on PC, Android and iOS

on mobile. It can also accommodate up to 50 users in a video call.

6. Whatsapp - The best app for international calls. It is a world-renowned text messaging app. Whatsapp also has a business app called WhatsApp Business, of which the main targets are small business owners, but it is not very popular. WhatsApp allows access to Windows and macOS on PC, Android and iOS on mobile. WhatsApp - The application is mostly used for informal meetings, for example for communication with friends or relatives, because it can access a maximum of 4 users via video call, which is much less in comparison with other applications.
7. Google Meet – The best for fast video calls. It is a relatively new app, so it is not as popular as Zoom. The great advantage of Google Meet is that it is available through Gmail and is so easy to use. You can also access it with a standalone application on both Windows and macOS on a personal computer and on Android and iOS on mobile. However, you need a Google Account to sign in to the meeting. It is possible to involve 250 users.
8. Houseparty- this is entertaining video call app, which we have already mentioned above.

Some research has shown that in case of choosing the right technology, studying on the Internet takes 40-60% less time for students than under traditional learning conditions, because they have 25-60% more material while studying on the Internet compared to the normal environment. [9].

In this article is brought a statistical analysis of most used digital communication tools by tudents from different levels (undergraduate, graduate, doctoral) in distance learning, discusses which digital technology is most preferred, what is their attitude to online learning in general, what they

consider as the biggest advantage and the biggest disadvantage of distance learning process.

The answers to these questions were given to us by a survey conducted on the basis of questionnaires filled by the students of Ivane Javakhishvili Tbilisi State University and Ilia University from all three levels. Students were represented from different parts of Georgia.

In addition to these issues, the article also shows if gender and level of learning influences on the choice of digital communication medium.

Data processing and analysis was performed in the statistical program SPSS.

Statistical analysis revealed that from the following tools of communication: 1. Phone calls, sms 2. Email, 3 Whatsapp / Viber / Skype, 4 Microsoft Teams / Zoom, 5 Messenger; most of them use Microsoft Teams / Zoom - 36% of students, It is followed by Messenger - 29%, followed by e-mail - 19%, phone calls and SMS - 14%, and the least used was Whatsapp / Viber / Skype - 11%.

As for students' attitudes towards distance learning, the survey showed that the majority of respondents (45%) prefer non-distance studying in an educational institution, 23% believe that

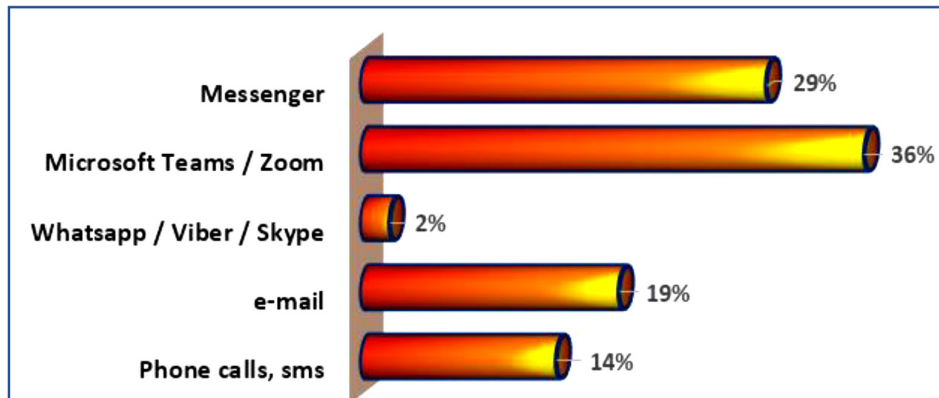


Fig. 1 Frequency of used communication tools by students

Source: Compiled by the author

distance learning has a negative impact on student learning, 18% of students believe that distance learning is comfortable and facilitates the learning process. While 4% believe that distance learning has no effect. Judging by the cumulative percentage, only 36% evaluate distance learning positively.

On question what students think what is the biggest advantage of distance learning, most of them, with a fairly large percentage - 56% consider as an advantage to be able to turn on from anywhere, 18% - name a comfortable environment, 13% - reduce transportation costs,

10% - save transportation time, while 4% believe that learn in online mode has no advantage.

It is also interesting what remains as the biggest disadvantage of distance learning pointed out by the students, it is illustrated by the diagram below, where clearly and with the highest percentage is named "reducing relationships with group members". Which confirms the fact that in order to maintain a normal psyche and feeling they need contact and communication with each other. A significant proportion of 19% names "fatigue and stress caused by computer"

To find out whether gender and level of

learning influenced the choice of communication, let us hypothesize:

1. Gender and learning Level impact on

students' choice of means of communication.

2. Gender plays a certain role on students' choice of means of communication.

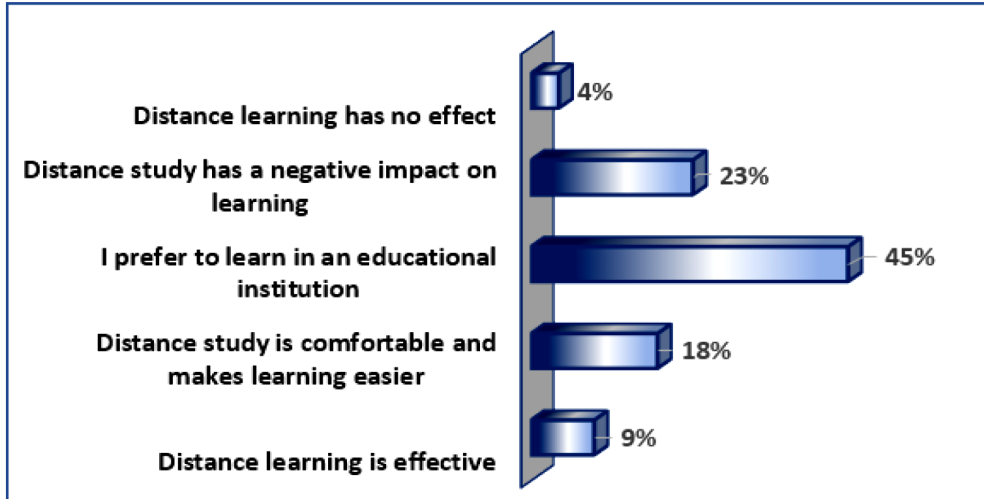


Fig.2. Students' attitude towards distance learning

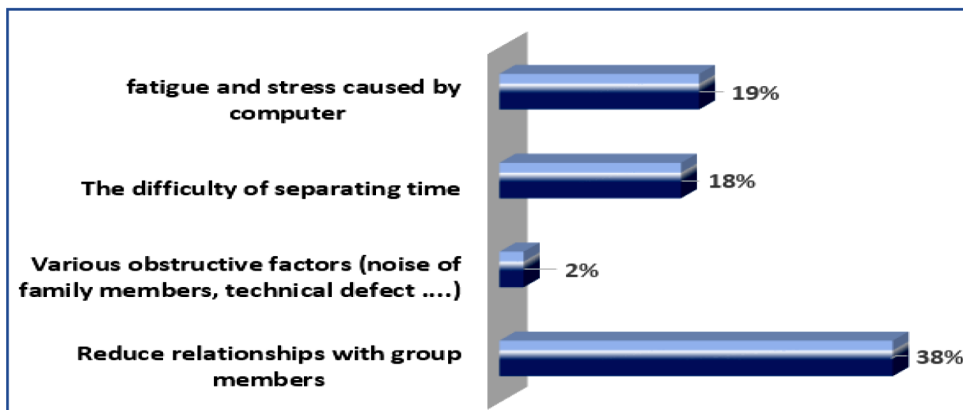


Fig. 3. the biggest drawback of distance learning - named by students

Source: Compiled by the author

3. Learning Level impacts on students' choice of means of communication.

For test the hypothesis, we used statistical procedure - Two Way ANOVA (Univariate Analysis of Variance).

From tables obtained from dispersion analysis, the first table includes the Levene test for homogeneity. In this case it is highly significant ($P < 0.001$), and it shows that gender and level

of learning together simultaneously influence students' choice of communication means (0.01 level of statistical significance). So the truth of the first hypothesis is proved.

From the separate factors as shown in Table 2, gender does not play a certain role in the use of communication tools by students ($P = 0.053$, the level of statistical significance exceeds 0.05), so the second hypothesis was not approved: there is no

table 1. Levene's Test of Equality of Error Variances

Dependent Variable: Which tool do you use most often during distance learning?

F	df1	df2	Sig.
5.191	5	506	.000

Source: Compiled by the author

sharp difference between the female and male students in terms of using communication tools.

As for the level of learning factor, according to Table 3, it was found that it influences the choice of means of communication by students (0.05 level of statistical significance, P=0.33). So the truth of the third hypothesis is proved.

table 2. The influence of gender on the use of communication tools by student

Univariate Tests

Dependent Variable: Which tool do you use most often during distance learning?

	Sum of Squares	df	Mean Square	F	Sig.
Gender	7.601	1	7.601	3.766	.053
Error	1021.152	506	2.018		

Source: Compiled by the author

1. Gender Attitudes Towards using Communication tools by students

Visual representations:

As the dispersion analysis makes it obvious,

table 3. The influence of learning level on the use of communication tools by student

Univariate Tests

Dependent Variable: Which tool do you use most often during distance learning?

	Sum of Squares	df	Mean Square	F	Sig.
learning level	13.920	2	6.960	3.449	.033
Error	1021.152	506	2.018		

the graph clearly shows that female and male respondents are characterized by an almost uniform trend in terms of the means of communication used. We can note that the slight advantage in terms of messenger and zoom is on

the male respondents side, while on the phone calls - on the female respondents side.

2. The relationship of the level of learning with the choice of communication means by students is shown in the following graph:

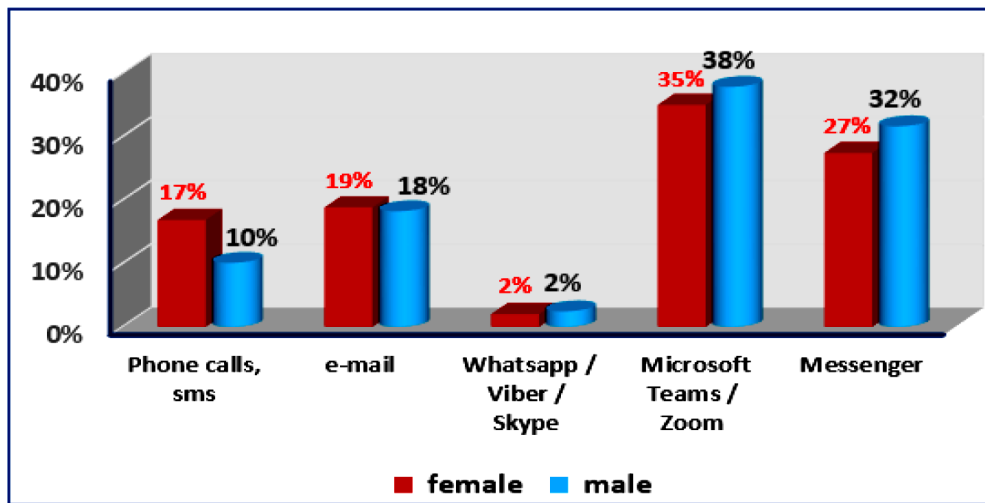


fig. 4. Gender * Which tool do you use most often during distance learning?

Source: Compiled by the author

As it can be seen from Fig. 5, students in all three levels predominantly use Microsoft Teams / Zoom. Then comes Messenger.

Ba students after Microsoft Teams / Zoom and Messenger use e-mail (19%) more than phone calls (13%), while Ma students after Microsoft

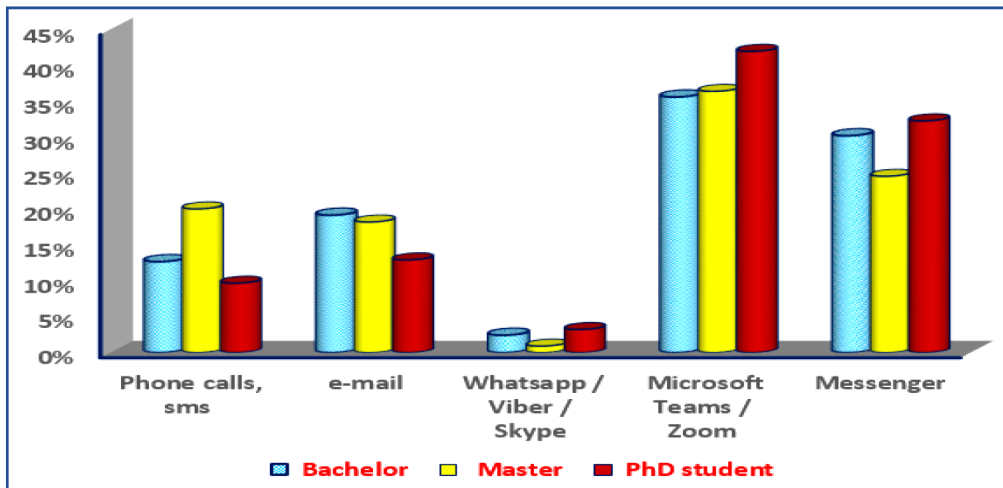


Fig. 5. Learning level * which tool do you use most often during distance learning?

Teams / Zoom and Messenger prefer phone calls over e-mail. PhD students after Microsoft Teams / Zoom and Messenger prefer email more than phone calls (13%). As for Whatsapp / Viber / Skype, it is in the last place for students of all levels.

CONCLUSION

Based on the above research we can bring the following conclusions that:

- Students / masters / doctoral students prefer

direct communication.

- Students / masters / doctoral students consider the fact that they can engage from any place at any time as the advantage of online mode.

As expected, one of the biggest drawbacks of distance learning / work is the “reduced relationship with group members”.

- Although modern digital technologies are much easier to use, many of them, as it turned out, cause stress and fatigue, which must be explained by the addiction on computer / mobile phone, as well as psychological factor that now it is required by the students’ obligations, otherwise when

the student voluntarily without any kind of obligations communicates with a computer or mobile phone for hours, time passes so fast that she/he can not even understand. But Without modern approaches the educational establishment will become even less attractive [10].

However, in any case, students must follow the safety norms of working with a computer, and find out the form of using a computer in a way that does not harm their health, in particular, their spine, eyesight, psyche. The administration should also create the schedule that does not cause an imbalance in their physical condition during distance learning.

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