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CYPRUS UNIVERSITY STUDENTS' EXPERIENCES OF CHANGES IN EDUCATION IN THE AGE OF THE CORONAVIRUS PANDEMIC

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CYPRUS UNIVERSITY STUDENTS' EXPERIENCES OF CHANGES IN EDUCATION IN THE AGE OF THE CORONAVIRUS PANDEMIC

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Abstract:

In March of 2020 as a measure for the control of the coronavirus spread there was a worldwide closure of schools at all levels of education. Students and educators needed to immediately respond to the challenge of continuing the education under the new circumstances. That involved migrating all education offerings to a fully virtual environment. The migration which took place amidst the academic year proved to be very challenging in a number of ways. This paper reports on an empirical study which was completed in Cyprus and involved university students. The study surveyed the technological, economic, and psychological challenges faced by students as a result of the pandemic.

Keywords: Distance mode education, e-learning, Covid-19 pandemic

I. INTRODUCTION

From the beginning of the Coronavirus pandemic in March of 2020 until now a number of studies were undertaken reporting on the new conditions of delivering education and the effects of the pandemic on learning at the higher education level worldwide. Aspects which touch upon socio-technical, economical and other issues inspected from the pedagogical and social science perspective are available for many countries worldwide. Their findings show both commonalities as well as a lot of differences between countries. Examples of these studies are (Lily, 2020; Aguilera-Hermida, 2020; Praghlapati, 2021; Mishra, 2020). Some of the reports also considered the students' viewpoints and experiences. For example, Oyedotun (2020), presents a change in pedagogy imposed by the transition to online distance learning and lists a number of complex educational challenges which might be common to several countries in different degrees.

Georgiadou et al., (2021), have completed a survey which involved 1005 students from 26 countries and explored problems and challenges relating to the availability of communication and learning platforms as well as the access to these technologies. The study also investigated issues relating to cybersecurity. The students were invited to share their ideas and suggestions which would offer to an improved educational experience. Such international studies which make comparisons between countries are very important as we are already aware of existing socio-economic inequalities and the digital divide which during the pandemic have worsened (Hussain, 2020; WLF, 2020; OECD, 2020).

This paper is a sub-study of the international study of Georgiadou et al. (2021), and concerns the investigation of the issues mentioned above, within one country, being Cyprus. The findings of this study are also compared to the overall results reached in the international study.

II. THE PURPOSE AND DESIGN OF THE STUDY

At the beginning of the Coronavirus pandemic, we participated in a study which considered the rapid changes in the delivery of education under the new norm of the fully virtual pedagogic model. The study focussed on the impact on educators and the findings are reported in Georgiadou et al.,

(2020). To complement this study, we then shifted our focus to students and investigated the student learning experience under the Coronavirus pandemic conditions.

For this study we collected secondary data via conducting a literature review and primary data by using a questionnaire as part of our survey research.

QUESTIONNAIRE DESIGN

For the design of the questionnaire questions were grouped in the following sections: Demographics, Facilities, Learning, Communication, and Privacy and Security. The questionnaire which was initially 10 pages long was then converted to an online format. Ethical approval for its use was obtained by the Research Ethics Committee of Middlesex University, London UK.

PARTICIPANTS

The survey population consisted of 54 university students (N=54) in Cyprus, who have voluntarily completed an online questionnaire.

III. RESEARCH FINDINGS

The results are presented below in diagrammatic form followed by a brief discussion and explanation for each of the following sections:

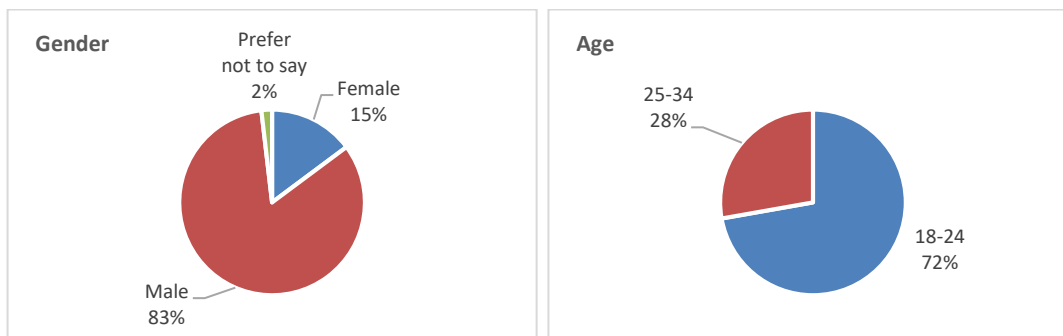
- Demographics
- Facilities
- Learning
- Communication
- Security and Privacy

DEMOGRAPHICS

The majority of the participants (83%) were male, between 18-24 years of age (72%). The summarized demographic information of the participants is shown in Table 1 and Figures 1 and 2.

Table 1 Demographic information

N=54	#	%
Sex:		
Female	8	15
Male	45	83
Prefer not to say	1	2
Age:		
Under 18	0	0
18-24	39	72
25-34	15	28
35-44	0	0
45+	0	0



Figures 1-2 Graphical representation of demographic information

The sample contained students majoring in different subject areas. The main subjects of the respondents were Computing (67%) and Engineering (13%).

FACILITIES

As technology is necessary for distance learning, the questions which were included in this section investigated the availability of and access to the necessary equipment including a reliable internet connection. The issues were approached in pairs looking at the **before** and **during** the pandemic reality.

All of the students had internet access at home when the pandemic broke out.

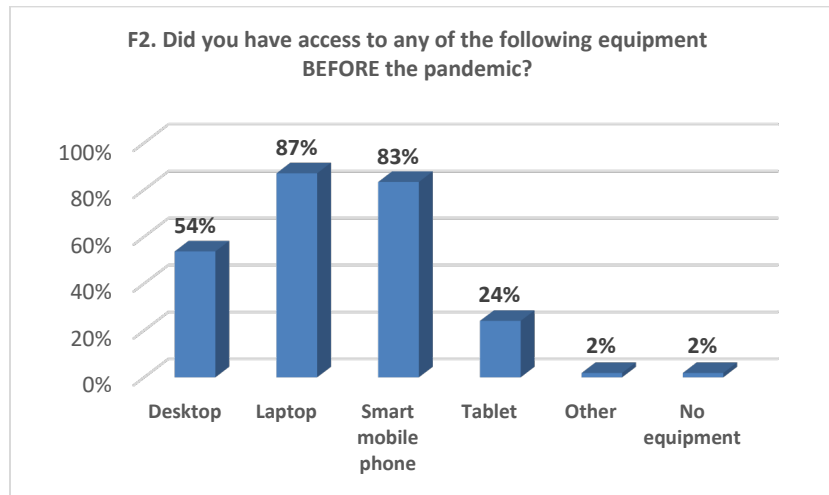


Figure 3: Access to equipment BEFORE the pandemic

Figure 3 shows that most students had access to the necessary equipment before the pandemic. Some students have access to several devices.

Figure 4 shows that almost half of the respondents (44%) did not need any equipment upgrades.

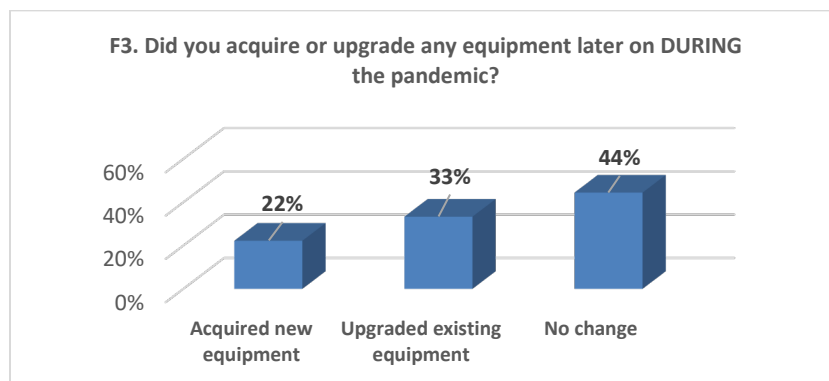


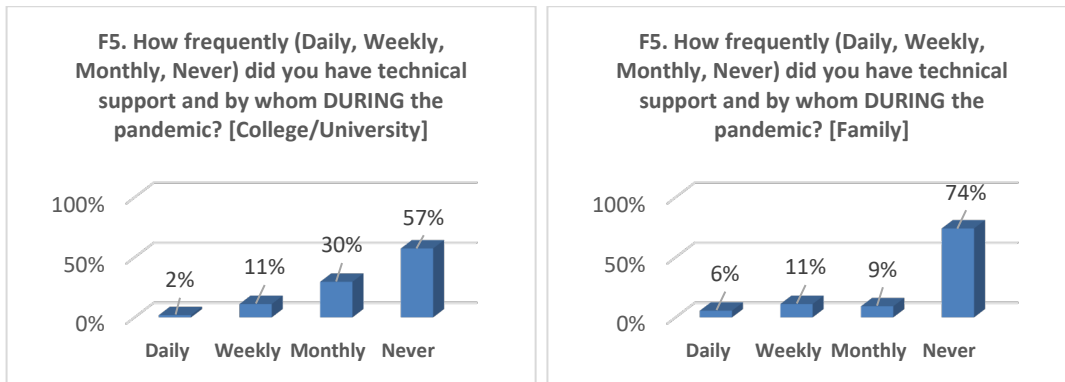
Figure 4: Acquire and upgrade of equipment during the pandemic

Also, in 63% of the cases only one person used the equipment, i.e., they did not have to share it with any members of their family.

Regarding any support that the students received during the pandemic, the majority did not receive any support from any source:

- 87% never received any support from the Municipality/Local Authority
- 94% never received any support from Charity
- 57% never received any support from the College/University (Figure 5)

- 74% never received any support from Family (Figure 6)
- 76% never received any support from Friends.



Frequency of technical support from
Figure 5: College/University

Frequency of technical support from
Figure 6: Family

Figure 7 shows the learning and communication platforms used by students during the pandemic. The platforms used the most by the students were the Moodle (87%), Webex (89%), Zoom (50%) and Microsoft Teams (46%).

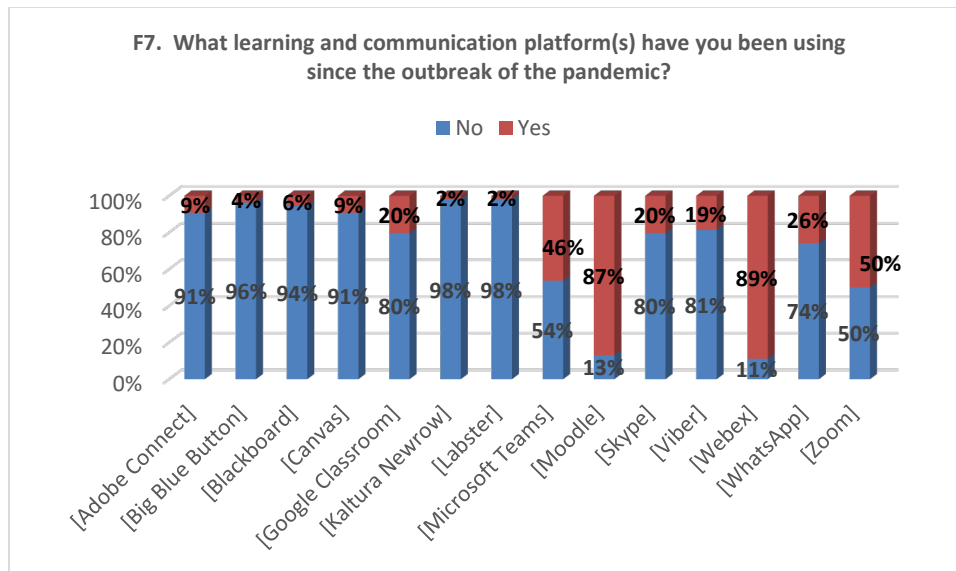


Figure 7: Learning and communication platforms used during the pandemic

Figure 8 is about the knowledge and experience of students in using different learning and communication platforms. Students were more experienced with Webex, Moodle, Zoom, and Microsoft Teams which they were probably using from before the pandemic.

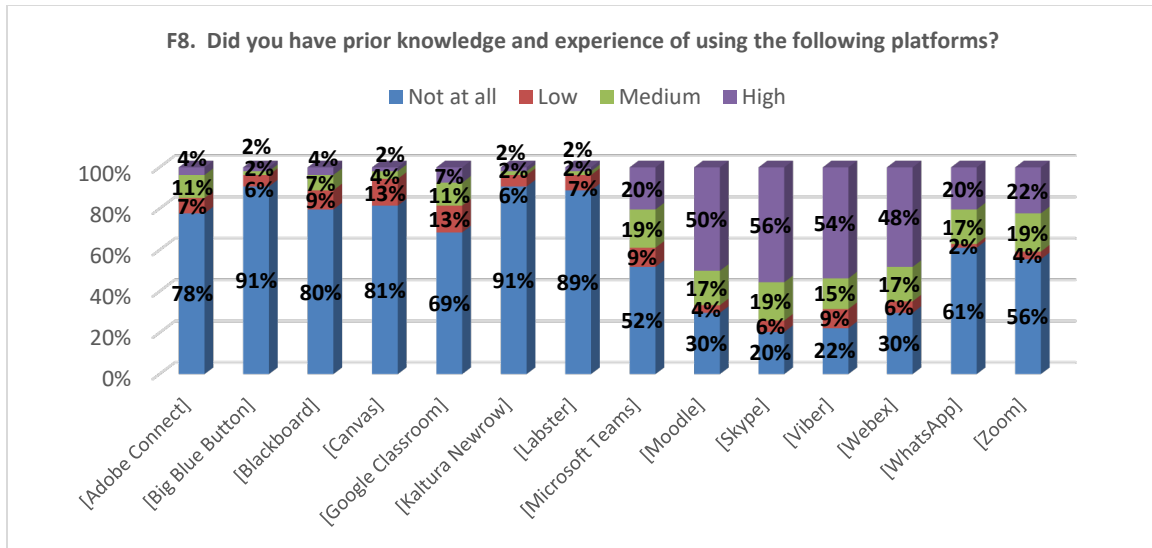


Figure 8: Knowledge and experience of using different learning and communication platforms

LEARNING

The second section looked into the students’ learning experience and how this was affected by the pandemic.

Figure 9 shows that the majority of the students (48%) prefer a mixed learning style. Another big percentage (37%) voted for the face-to-face learning and only a small percentage (15%) voted for online learning.

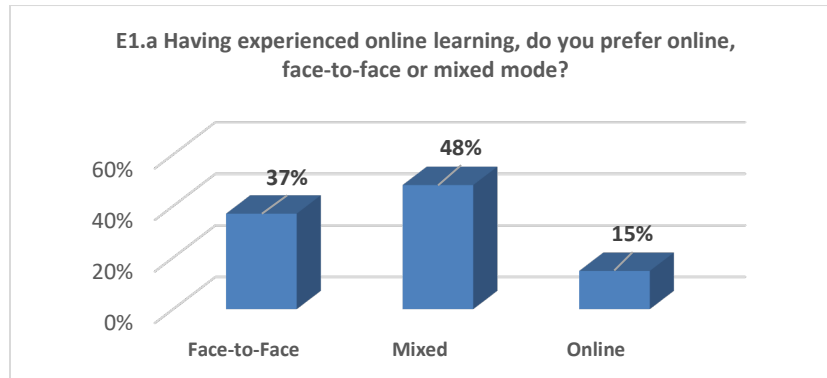


Figure 9: Learning style preference

Figure 10 shows the students’ preference for the delivery of lectures, seminars, workshops and labs. They consider that the best form of delivery is: a) for lectures, the face-to-face (37%) or live online (33%), b) for seminars, the live online (33%) of face-to-face (31%), c) for workshops, clearly the face-to-face (52%), and d) for labs, definitely face-to-face (69%).

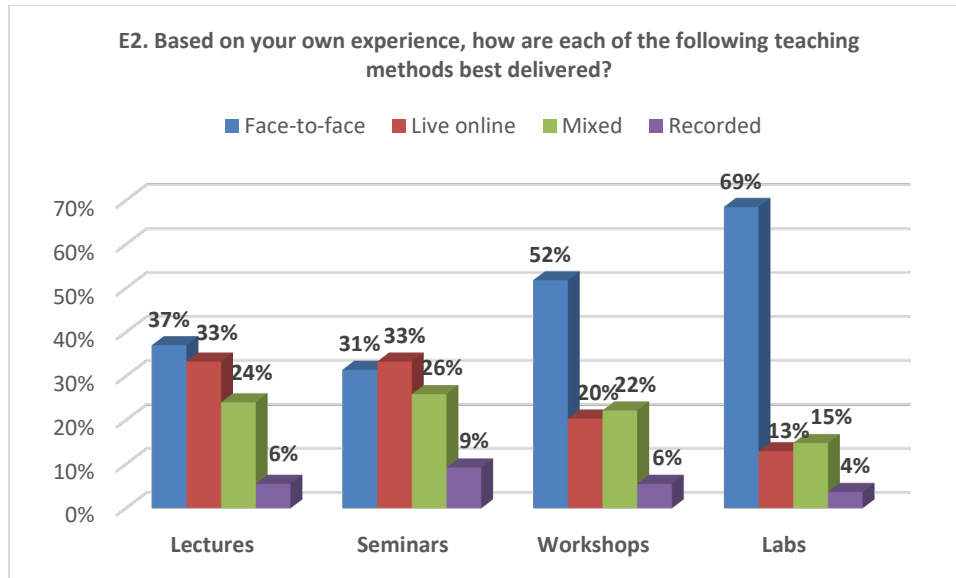


Figure 10: Delivery of lectures

The majority of the students (65%) do not believe that face-to-face teaching will disappear in the future (Figure 11). At the same time, a big majority (67%) see distance education being widespread in the future with the use of gamification methodologies and tools (Figure 12).

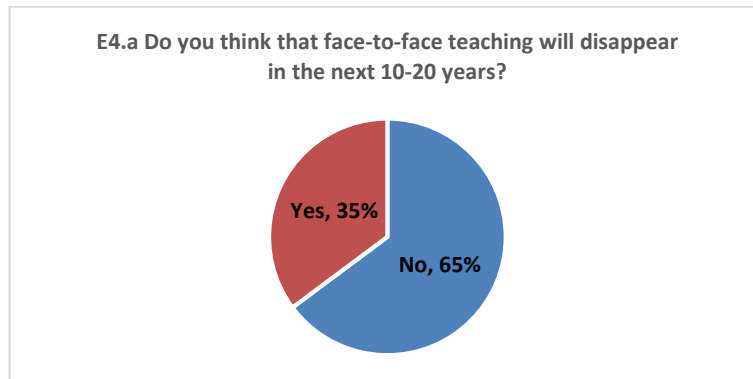


Figure 11: Future of face-to-face teaching

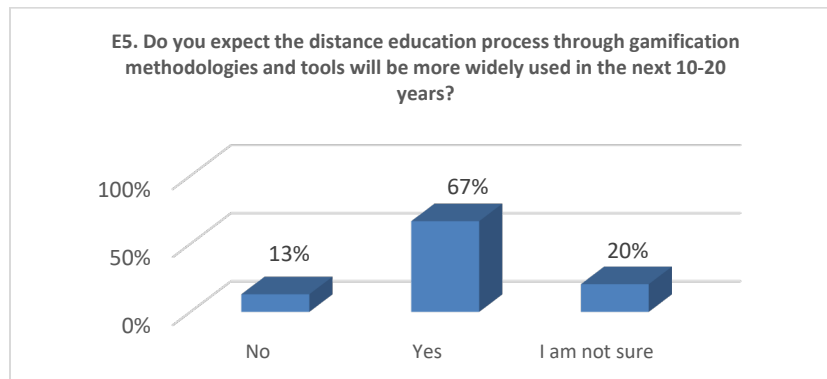


Figure 12: Future of distance education using gamification

The next figure (Figures 13) presents the learning methods and the degree to which these were used during the pandemic. The outcome shows:

- Live class being used daily by 67% of the students,

- Recorded broadcast used weekly by 44% of the students,
- Prior self-study used weekly by 39%, and
- Self-study used weekly (44%) and daily (39%) by students.

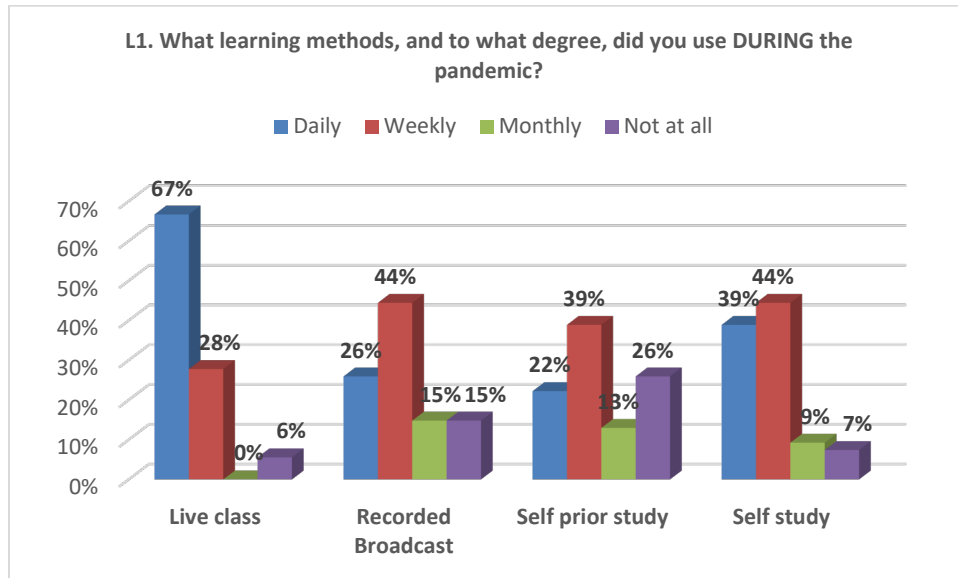


Figure 13: Learning methods used during the pandemic

Looking at the amount of time dedicated by students on studying before and during the lockdown, Figure 14 shows that 52% of the respondents spent more time on studying during the lockdown. As seen in Figure 15, this increase translated into:

- Medium ($\geq 50\%$) increase by the 38% of the students in daily study,
- Medium ($\geq 50\%$) increase by the 59% of the students in weekly study.

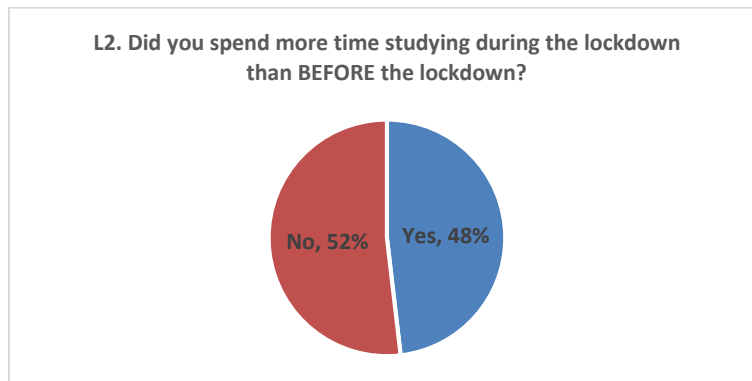


Figure 14: Study time during the lockdown

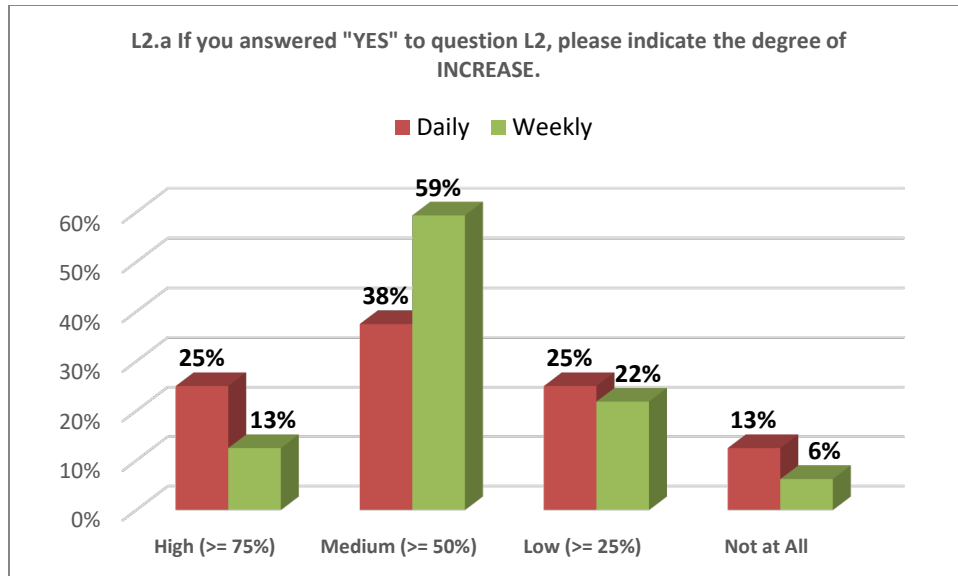


Figure 15: Daily and weekly increase in study time during the lockdown

For those of the respondents who spent less time on studying during the lockdown, this translated into:

- Medium (>=50%) or low (>=25%) decrease by the 26% for each group of the students in daily study. At the same time 30% of the respondents spent the same time as before the lockdown.
- Medium (>=50%) decrease by the 41% of the students in weekly study (Figure 16).

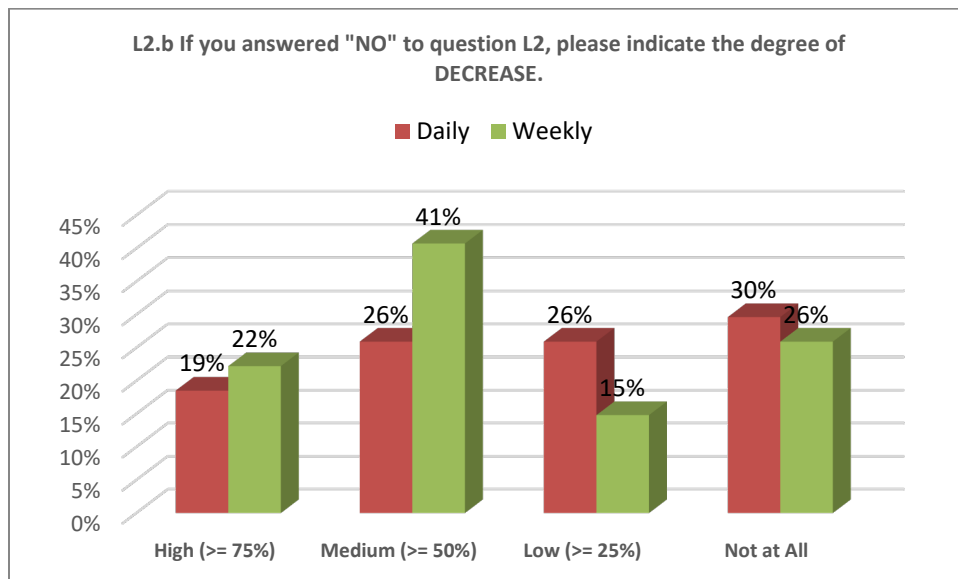


Figure 16: Daily and weekly decrease in study time during the lockdown

COMMUNICATION

The questions of this section aimed at shedding light on the communication that students had with fellow students, lecturers, friends and family during the pandemic. Was distance learning isolating students? Was the lockdown affecting their communication with others?

Most students (70%) felt that the communication between themselves and other students was encouraged. The same was the case for their communication with their lecturers. Even higher percentages of students felt that the communication between themselves and their family members (76%) as well as the communication with their friends (74%) were encouraged to a high degree. Keeping all communication channels open during the lockdown was very important (Figure 17).

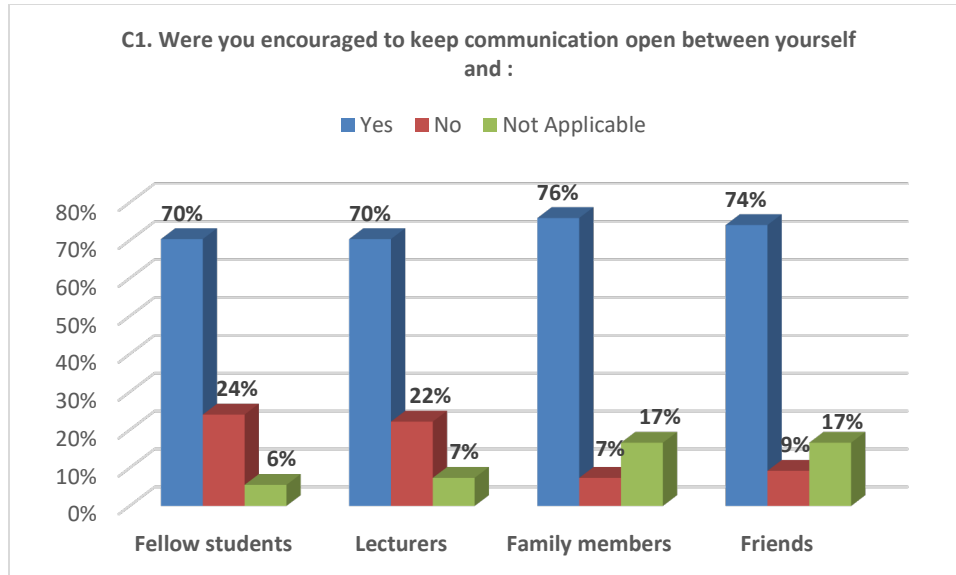


Figure 17: Encouragement of communication with fellow students

The frequency of students' communications before and during the lockdown were examined next. Figure 18 shows that the daily and weekly communication with their lecturers decreased while the every-two-weeks and monthly communication increased.

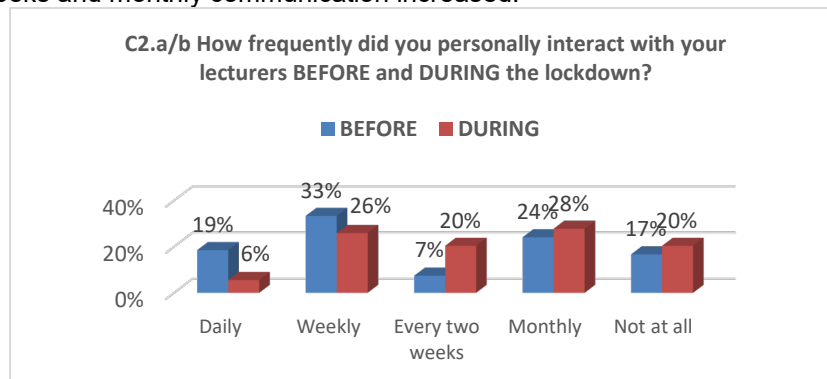


Figure 18: Encouragement of communication with lecturers BEFORE and DURING the lockdown

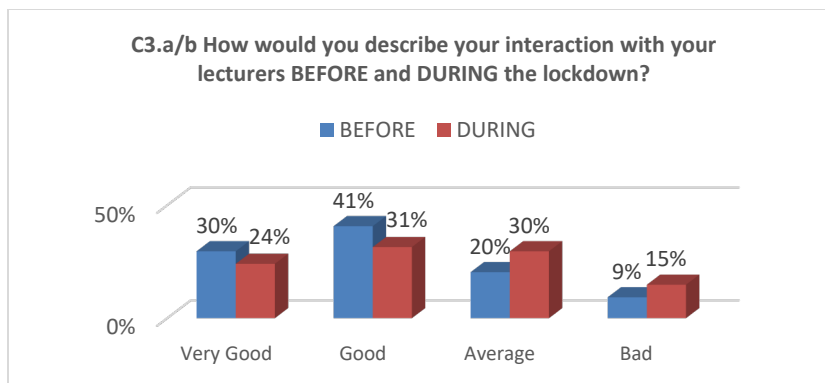


Figure 19: Quality of communication with lecturers BEFORE and DURING the lockdown

Figure 19 shows that the quality of interaction with lecturers decreased during the lockdown. In Figure 20 we observe that before the lockdown almost half of the students and during the lockdown more than 1/3 of the students spent less than 15 minutes for the communication with their lecturers. The students’ percentage who had no contact with their lecturers during the lockdown has increased from 9% to 26%.

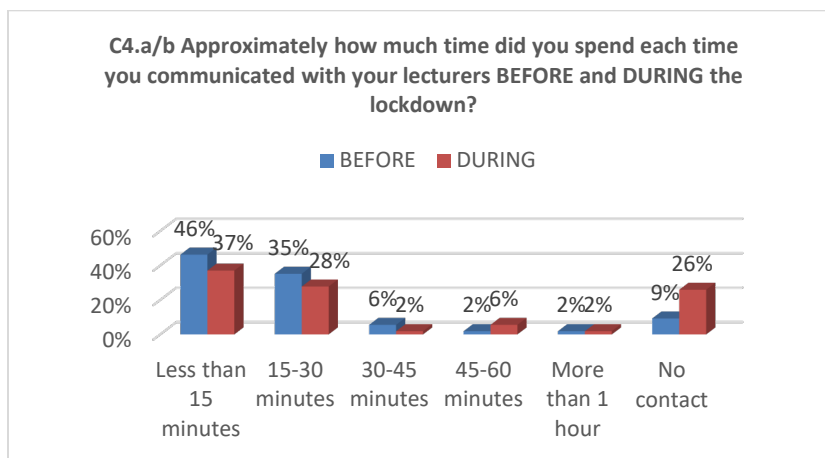


Figure 20: Communication time with lecturers BEFORE and DURING the lockdown

SECURITY AND PRIVACY

Virtual education implies a heavy dependence on information and communication technology and the cyberspace. Such dependence would be associated with a number of risks and threads (Nam, 2019), examples of which include: a) Distributed Denial of Services (DDoS), which may affect the access of students to educational resources; b) phishing attacks, which could involve stealing students’ and/or teachers’ access credentials and subsequently using them in adverse ways. Other problems include misinformation as a result of fake news and their dissemination. Critical thinking and literacy are always very importance in preventing such situations from evolving (Georgiadou, 2018).

Thus, this section intended to investigate issues relating to the protection of private data, and the students’ preparedness to recognize and handle issues relating to cybercrime, online privacy and security.

Beginning with a question regarding the students’ awareness of university measures for private data protection, a bit more than half of the student population was aware of some measures taken in that direction (Figure 21).

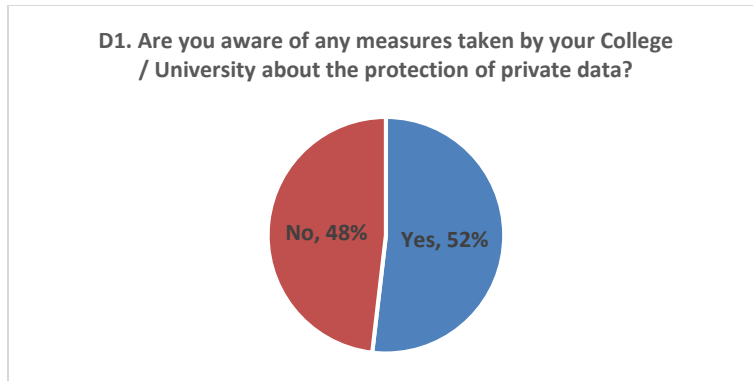


Figure 21: Awareness of measures taken by the university on private data protection

The majority of the participants had no training regarding cybersecurity basic issues neither before nor during the migration to online learning. Such issues include phishing and other attacks (before-68.5% | during-77.8%) (Figure 22), online privacy (before-66.7% | during-81.5%) (Figure 23) and secure passwords (before-61.1% | during-79.6%) (Figure 24).

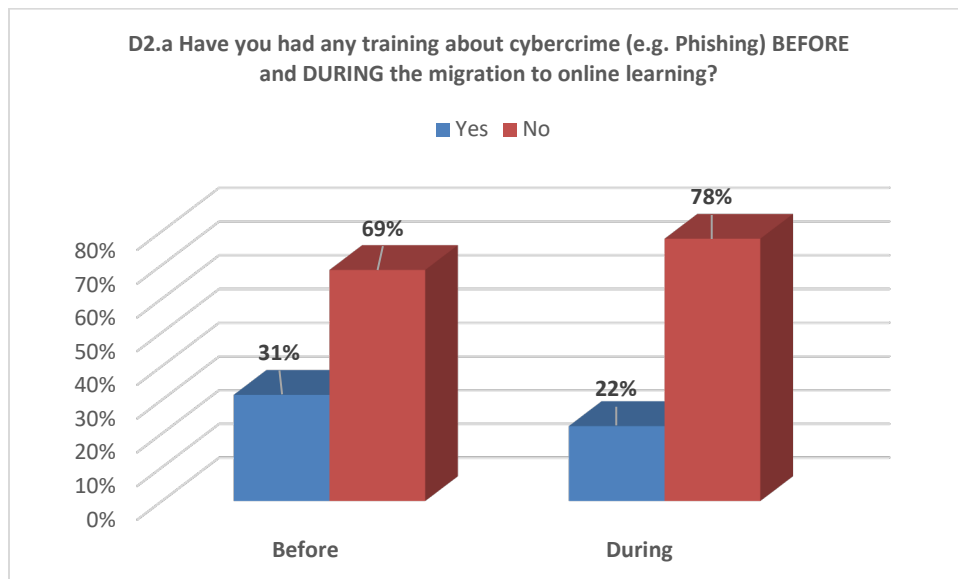
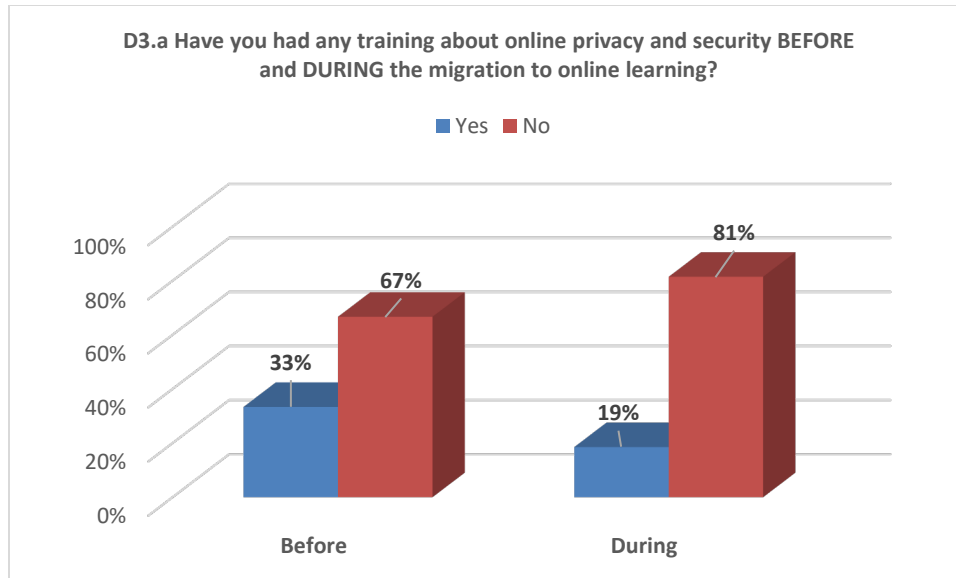
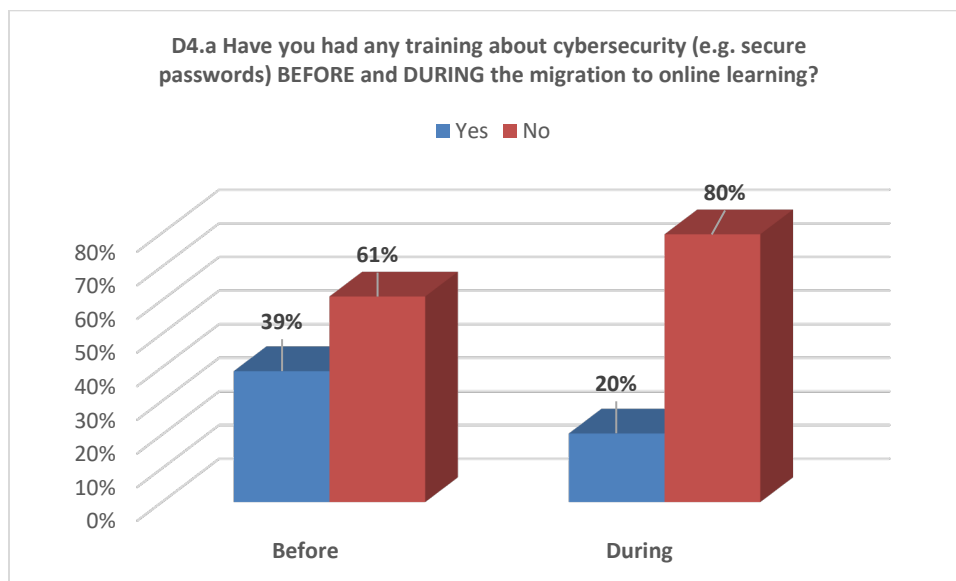


Figure 22: Training on cybercrime **before** and **during** the migration to online learning



Figures 23: Training about online privacy and security **before** and **during** the migration to online learning



Figures 24: Training about cybersecurity **before** and **during** the migration to online learning

Figure 25 which follows refers to the encounters of the participants with problems caused by cybercriminals before the pandemic, while figure 26 refers to similar experiences during the migration to online learning.

Considering the before the pandemic situation and in regards to the participants' own experience of cyberthreats or invasions, it is evident that the great majority of the participants have not experienced any such problems. A few more than half of the participants (59.3%) have experienced unwanted adverts and a smaller group (40.7%) had phishing incidents before the pandemic. Very few (14.8%) of the participants had any problems related to identity theft before the pandemic (Figure 25).

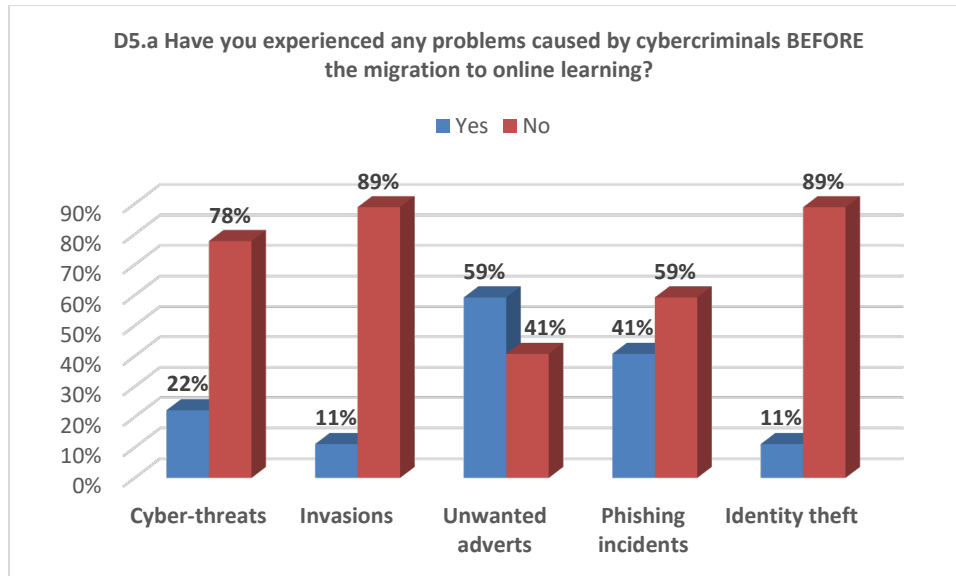


Figure 25: Experiences of problems caused by cybercriminals **before** the pandemic

The participants had similar experiences with problems caused by cybercriminals during the migration to online learning. Specifically, the participants' experience of cyberthreats was 14.8% (was 22.2% before) and the percentage remained the same (11.1%) in relation to experiences of invasions (Figure 26).

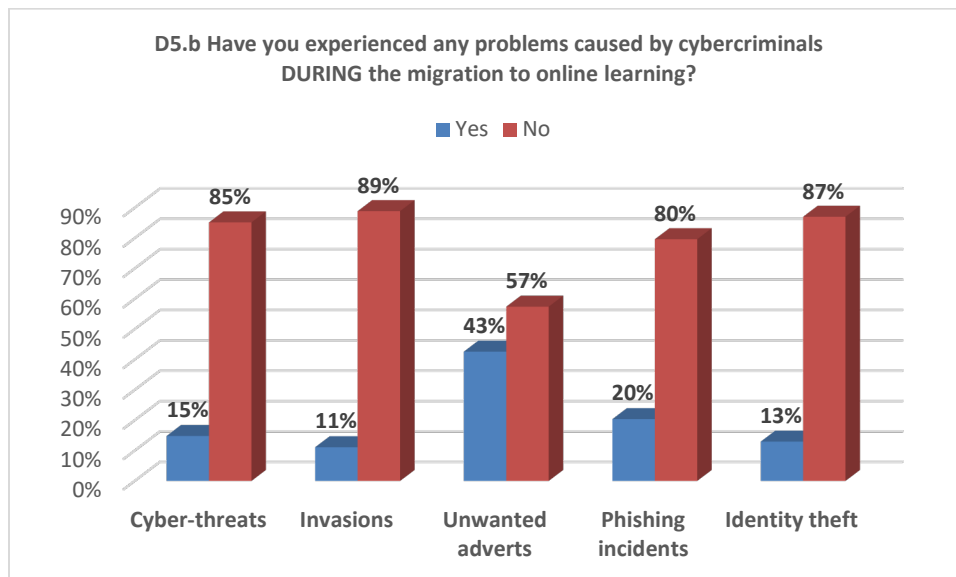


Figure 26: Experiences of problems caused by cybercriminals **during** the migration to online learning

Same as before the pandemic, close to half of the participants (42.6%) have experienced unwanted adverts while the percentage of those who had phishing incidents during the migration has dropped to 20.4%. Lastly, a small percentage of participants (13%) had experienced problems related to identity theft during the migration (Figure 26).

Overall, the experiences of participants with cybercriminal activity were similar before and during the migration to online learning. The need for raising the awareness and providing training on matters of cybersecurity remains, even though the incidents of such problems might not have been very high. Security guidelines should be written for students, teachers, and staff to explain the

necessary measures to take when participating in virtual learning. Such guidelines will improve the feeling of security and ultimately the users' experience (Chaudhary, 2015; Li, 2013).

IV. CONCLUSIONS

SUMMARY OF FINDINGS

The present study focussed on students and investigated the student learning experience under the Coronavirus pandemic conditions. The participants of the study were 54 university students in Cyprus. Therefore, the conclusions drawn below are specific to this country.

Virtual education without the necessary ICT is not possible. The investigation for the required facilities before and during the pandemic revealed that the greatest majority of the students (96%) had accessed to the equipment required and all had access to the internet from before the pandemic. Some participants required upgrades (33%) and some (22%) acquired new equipment. Most of them (63%) were not sharing their equipment with others. Even bigger percentages ranging from 57-94% did not receive any support from any source during the pandemic.

In investigating the students' learning experience the study revealed the participants' preference for a mixed learning style (48%). More specifically for the delivery of lectures they selected face-to-face (37%) or live online (33%), while for labs the majority (69%) voted for face-to-face. Most of them (65%) believe that face-to-face teaching will live through and that gamification will empower distance education in the future (67%).

During the pandemic the students' educational experience involved daily use of live classes (67%), weekly use of recorded broadcast (44%), and weekly and daily self-study. The majority of the students (52%) spent more time on studying during the lockdown.

Students' communication with other students, with their lecturers, and with friends and family members was affected during the lockdown. Such communications were greatly encouraged (70%-76%). In particular, their communication with their lecturers did not actually increase or improve.

Regarding privacy and security in the cyberspace, half of the participants (52%) felt that the university had taken some measures for the protection of private data. The majority had no training regarding basic cybersecurity issues (before the pandemic: 61-69% | during the pandemic: 79-82%). At the same time some of them had some experiences with problems caused by cybercriminals. The most frequent problems were: unwanted adverts (before the pandemic: 59% | during the pandemic: 43%) and phishing incidents (before the pandemic: 41% | during the pandemic: 20%).

COMPARISON WITH INTERNATIONAL FINDINGS

The comparison is done with the international study of Georgiadou et al., (2021) to which the present study has contributed with the country-specific data.

The international study of Georgiadou et al., (2021) was carried out in 26 countries, from Asia, Europe, Africa, and America, between a total of 1005 participants, all college/university students. There are overall a lot of similarities between Cyprus' findings and the international findings.

There are no major differences between the two studies in terms of the facilities available to students before and during the pandemic. Also, in regards to the students' learning preferences the majority of the participants in the international cohort had, similar to the local cohort, expressed their preference for face-to-face and mixed learning delivery. They believe that face-to-face learning will still be practiced (69%) and that distance education with gamification features will be widely used in the future (51%). Study time has increased during the lockdown for most of the students (60%).

Concerning the participants' communication with others during the lockdown, the majority felt that such communication was encouraged (66-80%) and as they were connected for learning purposes, they seemed to have maintained contact throughout the pandemic.

Lastly, the participants' exposure to cybersecurity problems and the need for training on cyber-protection related issues also came through in the international study. Only a small group had received any training on cybercrime (before the pandemic: 32-38% | during the pandemic: 26-29%) whilst some experienced related problems (before the pandemic: 13-41% | during the pandemic: 14-16%).

THE FUTURE

Currently, there is a move towards a return to the face-to-face teaching and learning for the coming academic year 2021-2022. As all the involved parties got more technologically savvy the demand for a more technologically enhanced teaching will be raised. Changes in the teaching and learning approaches may also be expected. Let us all be optimistic about the future and keep these learning experiences we acquired as a bonus in the midst of the disasters that the pandemic has brought upon us.

ACKNOWLEDGEMENT

The authors would like to thank their co-researchers in the international study of Georgiadou et al., (2021). Our participation in the study has also made the publication of the present paper, which concentrates on one country, possible.

V. REFERENCES

- Aguilera-Hermida, A. (2020). College students' use and acceptance of emergency online learning due to COVID-19. (Elsevier, Ed.) *International Journal of Educational Research Open*.
- Chaudhary, S. B. (2015). Time up for phishing with effective anti-phishing research strategies. *International Journal of Human Capital and Information Technology Professionals*. Retrieved 04 06, 2021, from <http://www.igi-global.com/gateway/article/128310>
- Georgiadou, E., et al. (2018). Fake news and critical thinking in information evaluation. *WBILC2018- Proceedings International Scientific Conference "Western Balkan Information Literacy"*.
- Georgiadou, E., et al. (2020). Challenges of rapid migration to full virtual education in the age of the Corona virus pandemic: experiences from across the world. *e-Learning as a solution during unprecedented times in the 21st century (INSPIRE 2020 Proceedings)*. BCS. Retrieved 04 06, 2021
- Georgiadou, E., et al. (2021). Rapid migration from traditional or hybrid to full virtual education in the age of the coronavirus pandemic: Challenges, Experiences and View of College and University students. *INSPIRE 2021 Proceedings*. British Computer Society.
- Hussain, T. (2020). Education and COVID-19 in Nigeria: tackling the digital divide. Retrieved 08 20, 2021, from <https://www.soas.ac.uk/blogs/study/COVID-19-nigeria-digital-divide>
- Li, L. B. (2013). Towards a contingency approach with whitelist- and blacklist-based anti-phishing applications: what do usability tests indicate? *Behaviour and Information Technology*, 33(11), 1136-1147.

- Lily, A. I. (2020). Distance education as a response to pandemics: Coronavirus and Arab culture. *Technology in Society*. Retrieved from <https://doi.org/10.1016/j.techsoc.2020.101317>
- Mishra, L. G. (2020). Online teaching-learning in Higher Education during lockdown period of COVID-19 pandemic. *International Journal of Educational Research Open*.
- Nam, T. (2019). Understanding the gap between perceived threats to and preparedness for cybersecurity. *Technology in Society*.
- OECD. (2020). Education: From disruption to recovery; OECD Policy Responses to Corona Virus (COVID-19). Retrieved 01 27, 2021, from <https://en.unesco.org/COVID19/educationresponse>
- Oyedotun, T. (2020). Sudden change of pedagogy in education driven by COVID-19: perspectives and evaluation from a developing country. *Research in Globalization*, 1-5.
- Pragholapati, A. (2021, 02 14). COVID-19 Impact on Students. Retrieved from <https://edarxiv.org/895ed/>
- WLF. (2020). Education and COVID-19 in Nigeria: Tackling the Digital Divide. Retrieved from <https://worldliteracyfoundation.org/education-and-COVID-10-in-nigeria>