The impact of Covid-19 on education quality and learning efficiency in universities: Evidence from Armenia

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The aim of the article is to report on how the Covid-19 pandemic influenced education quality and learning efficiency in universities in the Republic of Armenia. A survey was administered to 783 students and 169 academic staff members at one of the universities in Armenia. Results indicate that both students (73%) and academic staff (54%) preferred offline (classroom) learning. The level of satisfaction with the effectiveness of online learning among academic staff was higher (65%) then among students (54%). The survey revealed some positive sides of online learning, connected with being able to record lessons; time flexibility; savings of time and money on transportation; and computer skills development. However, online learning has many negative sides, including being more tedious and stressful; lacking face-to-face communication and socialisation; a lack of control; leading to a competitive environment among students; difficulty in using interactive methods; and technical issues can occur frequently. The findings may be useful for universities in small, developing countries seeking to improve their online learning and education quality.

Introduction

The Covid-19 pandemic brought a new reality into the world. All countries suffered and still suffer from lockdowns, crises, unemployment, and pressures on health systems. At the beginning of the pandemic, many activities turned to online modes, for example, classes in schools, colleges, universities, and jobs in some places. The sudden turning to online learning brought many problems. In many universities or other institutions, lecturers and students were not ready for online education, there were technical issues, and people began to suffer from social isolation. Many people felt that learning in classrooms with face-to-face interactive methods is much more effective than sitting at home alone, in front of a computer, without talking with others physically.

This paper presents an empirical study analysing how the pandemic influenced the education quality and learning efficiency in universities in the Republic of Armenia. The research results are based on surveys of students and lecturers at one of Armenia's universities, which show that both students and lecturers were not satisfied with online learning during the pandemic. The main problems were connected with technical issues, not knowing the details of online learning, difficulties with understanding (explaining) the lesson online, and difficulties with knowledge assessment. The results may help universities to take steps to improve the revealed issues in the future, as online learning may be a good way of learning, if all participants know how to use digital technologies, and are aware of online learning methods.

Literature review

The quality of education always impacts the satisfaction level of students (Tovmasyan, 2018). The pandemic had a bad influence on education quality as many studies show. For example, recent research in India indicates that Covid-19 pandemic had a bad impact on the education system. Because of the lockdown, classes in universities and schools went online, but the research showed that due to this transformation in teaching mode, students, teachers and parents faced many problems (Tarkar, 2020). During the pandemic, many universities either postponed or cancelled all campus events and took intensive measures to protect their staff and students from this disease (Sahu, 2020).

Closure of educational institutions due to the pandemic has disrupted the lives and learning of a whole generation of students. Teachers, who do not have knowledge of online teaching, also have had difficulties (Stanistreet, et al., 2020). Several studies in many countries reveal that the pandemic and closing of universities affected the mental health of students and their levels of physical activity were reduced (Lopez-Valenciano, et al., 2021). Surveys among students reveal that for them it is better to study in physical classrooms, as online learning is stressful and it affects their social life (Chakraborty, et al. 2020). A study in France showed that students suffered from a particularly high level of anxiety, depression and distress during the pandemic (Essadek & Rabeyron, 2020). In Greece students suffered from depression, anxiety, worsening sleep quality and life quality because of the pandemic (Kaparounaki et al., 2020). According to Aguilera-Hermida (2020) motivation, self-efficacy, and cognitive engagement of US college students decreased during online education, and only the use of technology increased. In China, the Covid-19 pandemic has impacted the mental health of university students (Jiang, 2020). In the UK during the first 5 weeks of lockdown, mental wellbeing and physical activity of university students decreased, whilst perceived stress and time spent sedentary increased (Savage et al., 2020).

According to Rashid and Yadav (2020), the pandemic has revealed the main shortcomings of the current higher education system and there is a need for training educators in digital technology which will assist adaptation to the rapidly changing education climate. According to a study in Ukraine, 86 % of Ukrainian lecturers had no substantial experience in online education before Covid-19, consequently there is a need to organise training courses in online education methods for lecturers (Stukalo & Simakhova, 2020).

Research by Ferry et al. (2020) revealed several technological, pedagogical and social challenges of remote teaching during the pandemic. Technological challenges were mainly related to the unreliability of Internet connections and the lack of essential electronic devices among many students. Pedagogical challenges were mainly associated with teachers' and students' lack of digital skills, the lack of structured content versus the abundance of online resources, students' lack of interactivity and motivation, and teachers' lack of social and cognitive presence. The social challenges were mainly related to the lack of human interaction between teachers and students as well as among the latter, the lack

of physical spaces at home to receive lessons, and the lack of support from parents who frequently were working remotely in the same spaces.

Research by Phuong (2022) examined the motivation of Vietnamese EFL learners in fully online classes during Covid-19. Factors that contributed greatly to online learning motivation included pedagogical strategies, teacher support, and the perceived usefulness, effectiveness and entertainment values of the course. According to a survey by Aristovnik et al. (2020) among 30,383 students from 62 countries, students with certain socio-demographic characteristics (male, part-time, first-level, applied sciences, a lower living standard, from Africa or Asia) were significantly less satisfied with their academic work/life during the crisis. Female, full-time, first-level students and students faced with financial problems were generally affected more by the pandemic in terms of their emotional life and personal circumstances. A study in Poland (Rizun & Strzelecki, 2020) showed that the best predictor of students' acceptance of shifting education to distance learning is enjoyment, followed by self-efficacy. Both perceived ease of use and perceived usefulness predict student's attitude towards using and intention to use the distance learning. Research in Libya during the pandemic period (Maatuk et al., 2021) found that the main issue of online learning was the low-quality of Internet services, though students believed that e-learning contributed to their learning. However, it reduced the workload on faculty and increased it on students. Faculty members agreed that e-learning is useful in increasing students' computer skills, although it requires significant financial resources (Maatuk et al., 2021).

Although the pandemic had a bad influence on education systems and reduced employment opportunities, but due to it, many new modes of learning emerged and will continue in the future (Jena, 2020). A recent study by García-González et al. (2022) analysed university students' expectations and needs in the Andalusia (Spain) region during Covid-19. The needs and expectations of students depend on university management developing and implementing a clear plan of action, continually communicating with students, training teachers in the virtual and hybrid modes, and building and maintaining empathetic relationships in the university community. Many other studies offer suggestions for higher education institutions about improvements in digitalised teaching, in education quality via innovation, technological development, resources use, and development via creating a better digital platform or environment which is essential for genuinely promoting the higher education development (e.g. Pu et al, 2022). Studies in developing countries (Tadesse & Muluye, 2020) have revealed that during pandemic these countries adoptred strategies to use educational technology, zero-fee Internet educational resources, free online learning resources, and broadcast teaching. During closures, higher educational institutions designed curriculum and prepared teaching-learning strategies for post-coronavirus (Tadesse & Muluye, 2020).

A study in Ghana (Upoalkpajor & Upoalkpajor, 2020) revealed that the pandemic had a huge impact on education in Ghana, and that universities want additional resources to recoup their losses through the pandemic (Upoalkpajor & Upoalkpajor, 2020). A study in Nigeria (Ogunode, Abigeal & Lydia, 2020) recommended that the Government increase

the funding of higher education to enable institutions to manage the damages caused by the Covid-19 pandemic.

Research done in Lombardy region in Italy (Agasisti, 2020) showed the prominent roles of governance and communication in ensuring continuity for students, support for faculty and the redesign of services for the administrative staff of higher education universities during the pandemic. A study in Jordan (Alsoud & Harasis, 2021) highlighted the role of electronic commerce in transforming distance learning. Further investments and contingency plans are needed to develop a resilient education system that supports electronic and distance learning throughout Jordan. A study in Bangladesh (Emon, et al., 2020) revealed that not only technologies but also technicalities are needed to run the education system smoothly during a pandemic period. Research done in the Philippines (Toquero, 2020) recommended educational institutions undertake studies to document and disseminate the impact of the pandemic on the educational system, and pointed out needs to strengthen curriculum practices and make it more responsive to learning needs of the students that go beyond conventional classrooms.

Method

The research uses both qualitative and quantitative methods. The survey was conducted among students and academic staff at the Armenian State University of Economics (ASUE). Data collection was done in January-March 2022 with online and paper questionnaires. 783 students participated in the survey, about 13% of students (the total number of students was 6026 at December 2021) (*ASUE annual report*, 2021). The sample size was calculated by setting the confidence level of 99.7%, and the margin of error ±5% of the surveyed value. 169 lecturers participated in the academic staff survey, about 56% of total academic staff (the total number of main academic staff was 300 in December 2021 (*ASUE annual report*, 2021)). For lecturers, the sample size was calculated by setting the confidence level at 95%, and the margin of error ±5% of the surveyed value. The calculations were done using *Sample Size Calculator* (Sample Size Calculator, n.d.). The questionnaires, created by the authors, included open, closed and semi-closed questions. The questionnaires were in Armenian, and analyses of survey results were translated into English for this article. The survey results were analysed using quantitative methods, with Pearson chi square testing and crosstabulation applied to evaluate relationships between some factors.

Empirical results and discussion

1. Organising lessons at ASUE during Covid-19 pandemic

As Covid-19 spread sharply in Armenia, ASUE was forced to switch to online teaching. Emergency remote teaching was the best solution at that time, as it was better than no teaching at all. Besides, at the beginning of the pandemic, it was not clear how long it would continue, as forecasts were not reliable. The educational system had to adapt to new challenges, one of which was an immediate switch to remote teaching in March 2020.

Initially, this caused some difficulties, as the process was new: both lecturers and students could not master the tools of online learning at once. The university introduced two important tools for online learning, *Moodle* and *UMS* (University management automation system). Lectures were organised through *Zoom*, as deans of faculties provided lecturers with links to a corporate Zoom package (unlimited access), enabling video conferencing of lectures and seminars in accordance with schedules. Lecturers and the Information Technologies division of ASUE were instructed to post videos of the online learning courses in the modules opened for them on Moodle. During the four semesters since the beginning of the pandemic, the university had to turn to distance learning from time to time, sometimes teaching in a hybrid or blended way. When lessons were organised at the university, the administrative and organisational department of ASUE carried out daily controls on observance of pandemic control rules by staff and students (wearing masks, temperature testing, etc.). Thus, from March 2020 till the second semester of 2022 the University was teaching in online, offline and hybrid modes.

It should be noted that Armenia's Internet penetration rate was 66.5% of the population at the start of 2022. Mobile connections in Armenia were equivalent to 131.1% of the population in January 2022 (Digital 2022: Armenia). Thus, it seems that students and lecturers mostly had good Internet and mobile phone access.

2. Survey analysis: Academic staff of ASUE

Table 1: Some information about staff participants in the survey
(N=169; f = frequency)

		f	%
Age	Up to 35 years old	34	20
	36-45 years old	65	39
	46-55 years old	32	19
	56-65 years old	22	13
	66 years old and more	16	9
Gender	Male	49	29
	Female	120	71
You teach in (participants could mention more than one answer)	Undergraduate program	167	99
	In the masters program	98	58
	In postgraduate studies	23	14
How many years of teaching experience do you have?	Up to 5 years	25	15
	6-15 years	65	38
	16-25 years	40	24
	26 years and more	39	23
Your degree	PhD	111	66
	Doctor of Sciences	10	6
	No degree	48	28

Source: Composed by authors based on survey results

Table 1 provides some demographic information about academic staff respondents to the survey. Most (59%) were in younger age brackets (up to 45 years); a high proportion

(71%) were women; a very high proportion (99%) had undergraduate teaching included in their duties; and a small proportion (28%) did not have a degree-level qualification.

Table 2: Online learning perceptions and experience of participants
(N=169; *f* = frequency)

		f	%
What do you think is the best way to teach?	In classroom (offline)	91	54.0
	Online	1	0.5
	Hybrid	77	45.5
Have you ever taught online before the pandemic?	Yes	26	15
	No	143	85
What problems did you encounter while teaching online? (participants could mention more than one answer)	Technical problems	108	64
	Not knowing the nuances of online teaching	10	6
	Difficulty in organising discussions during the lesson	42	25
	Insufficient computer skills	1	0.5
	Difficulty in explaining the material	3	2
	Difficulty in integrating students into the class	86	51
	Difficulty in using interactive methods	36	21
	The problem of socialisation	41	24
	Knowledge evaluation problems	81	48
	Difficulties of using electronic university system	19	11
	Absence of charter on online learning in the university / not knowing the charter	4	2
	Other	2	1
Would you like the lessons to be online always?	Yes	6	4
	No	144	85
	I find it difficult to answer	19	11
Do you think your students have learned more through online learning?	Yes	20	12
	No	86	51
	I cannot say	63	37
Which systems of online learning do you use? (participants could mention more than one answer)	Zoom	169	100
	Google Meet	52	31
	Facebook Messenger	59	35
	Google Hangouts	6	4
	Viber	33	20
	WhatsApp	30	18
	Microsoft Teams	14	8
	Other (Padlet, Socrative, Moodle, Kahoot, Crossword lab, Mentimetre)	3	2

Source: Composed by authors based on survey results

Table 2 shows online learning perceptions and experience of participants obtained from the survey. There was not a large gap between classroom (54%) and hybrid (both offline and online) (45.5%) as "best way to teach". Relatively few (15%) reported pre-pandemic online teaching experience, and technical problems were identified by many (64%) in their

naming of problems encountered. The highest nomination of system used was Zoom (100% of respondents).

The level of satisfaction of survey participants with the effectiveness of online learning was evaluated on a scale of 1 to 10 (1 = very dissatisfied, 10 = very satisfied), after *How to calculate a customer satisfaction score (CSAT)* (Call Center Helper, 2022).

$$\text{CSAT} = \text{Sum of all scores} \times 10 \: / \: \text{number of respondents} = 65$$

This means, that the level of satisfaction with the effectiveness of online learning among academic staff was only 65%.

A *net promoter score* (NPS) (What Is *Net Promoter*?, n.d.) was evaluated, by asking the participants, "How likely is it that you would recommend online learning to others (rate from 1 to 10, where 1=not at all likely, 10=very likely)". Scores in the range 1-6 represent detractors, 7-8 are passives, and 9-10 are promoters.

$$\text{NPS} = (\text{Promoters} - \text{detractors}) \times 100\% \: / \: \text{total number of responses}$$
$$= (13-115) \times 100 \: / \: 169 = -60\%$$

NPS may range from -100 (if every respondent is a detractor) to 100 (if every respondent is a promoter). Here detractors numbered 115 people, promoters only 13, and 41 were passives, resulting in NPS = -60%.

Survey participants also evaluated the degree of active participation of students in online learning (listening carefully, asking questions, participating in discussions) on a scale of 1 to 5 (1 = very low, 5 = very high). The average score was 3.1 (N=169). Besides, the survey participants were given 24 questions (Table 3), which they evaluated according to the level of disagree or agree on a five point scale.

Table 3: Online learning effectiveness level rated by academic staff of ASUE (N=169)
[SD (strongly disagree)=1; D (disagree)=2; N (neutral; to some extent I agree, to some extent no)=3; A (agree)=4; SA (strongly agree)=5; U (undecided; I cannot say; scored 0)]

Questions	Number of answers						Mean score
	SD	D	N	A	SA	U	
1. Online lessons are good because they can be recorded	24	17	44	35	21	28	3.09
2. Online training saves additional time and money on transportation, etc.	24	5	33	61	26	20	3.40
3. Online learning is good because it allows you to focus and not get distracted during the lesson	36	36	28	23	7	39	2.45
4. The online learning schedule is flexible	29	23	24	48	17	28	3.01
5. We are more tired of online teaching than classroom lessons	31	27	29	31	20	31	2.87

6.	Students participate in the lessons more freely during the online learning	31	49	27	18	7	37	2.40
7.	The effectiveness of online learning and classroom lessons is the same	39	52	24	12	1	41	2.09
8.	Our computer skills have increased through online learning	28	20	32	40	17	32	2.99
9.	It is easier to explain the lesson in online teaching than in the classroom	36	50	30	9	2	42	2.14
10.	In the case of online learning, the learner's responsibility and self-organisation is greater	35	55	23	8	3	45	2.10
11.	In the case of online teaching, it is more convenient to give lessons from home	31	37	33	26	6	36	2.54
12.	In the case of online learning, technical problems interfere the lesson	29	21	48	33	14	24	2.88
13.	In the case of online teaching, the lack of face-to-face communication prevents the lesson from being well explained	27	21	43	34	20	24	2.99
14.	In the case of online teaching, organising group work is difficult	23	27	41	34	7	37	2.81
15.	Online learning reduces social networking	28	13	25	45	23	35	3.16
16.	In the case of online learning, the competitive environment among students is weak	24	26	43	30	18	28	2.94
17.	The effectiveness of online learning depends on the extent to which teachers and students are well used to computer technology	26	31	42	26	19	25	2.87
18.	Online learning methods are better	23	51	32	16	8	39	2.50
19.	Social isolation has a positive effect on learning lessons	40	47	28	9	2	43	2.10
20.	Online learning is more time consuming than classroom learning	25	35	35	19	15	40	2.72
21.	Online learning is more stressful than classroom learning	24	30	45	19	10	41	2.70
22.	There is no noise when learning online and it is easier to manage the audience	24	31	32	32	13	37	2.84
23.	In online learning, it is difficult to control how well students participate in the lesson, whether they listen carefully or not.	30	15	28	48	27	21	3.18
24.	It is easier to assess knowledge in online learning	36	49	31	9	3	41	2.17

Source: Composed by authors based on survey results

From Table 3, some interesting findings may be derived. Higher than average scores could be noted for the following, where the last two ideas are negative sides to online learning:

- Online learning saves additional time and money on transportation, etc. (3.40);
- Online lessons are good because they can be recorded (3.09);
- The online learning schedule is flexible (3.01);
- Online learning reduces social networking (3.16);
- In online learning, it is difficult to control how well students participate in the lesson, whether they listen carefully or not (3.18).

Academic staff mostly disagreed with the following.

- Online learning is good because it allows you to focus and not get distracted during the lesson (2.45);
- Students participate in the lessons more freely during the online learning (2.40);
- The effectiveness of online learning and classroom lessons is the same (2.09);
- It is easier to explain the lesson in online teaching than in the classroom (2.14);
- In the case of online learning, the learner's responsibility and self-organisation is greater (2.10);
- Online learning methods are better (2.50);
- Social isolation has a positive effect on learning lessons (2.10);
- It is easier to assess knowledge in online learning (2.17).

Therefore, it may be concluded that academic staff are not well-satisfied with online learning; they assess the extent of students' participation as medium. According to them, the positive sides of online teaching are the opportunity to record lessons, flexible schedule, saving time and money on transportation, increase of computer skills, also, there is no noise when teaching online and it is easier to manage the audience.

The negative sides of online teaching are much more than positive ones. Negatives include: students' participation and responsibility is lower; teachers get tired of online teaching; it is difficult for them to explain the lesson online as there is no face-to-face communication which prevents the lesson from being well explained; technical problems may occur; online learning reduces socialisation; organising group work is difficult; the competitive environment among students is weak; online learning methods are not good; online learning is more stressful; it is difficult to control students; and it is difficult to assess students' knowledge in online learning.

Cross-tabulation and Pearson chi square analysis was done among some factors of survey (Appendix 1). The results indicate that there are significant relationships between the factors in the table.

It is interesting that online teaching satisfaction tended to be high (scores 8-10) among people who have 16-25 and 26 and more years of teaching experience. People who have 6-15 or less than 6 years of experience, tended to evaluate their satisfaction lower (scores 4-7). It is also interesting that among the small number of people who wish teaching to be always online (Table 2), are mainly people who have 16-25 years of teaching experience, and also the large majority (Table 2) who don't wish teaching to be always online are mainly people who have 6-15 years of teaching experience. This may means that for older

people it tends to be convenient to teach online from home, rather than to go to the university, whilst younger academics tend to want to teach offline in universities, to communicate with students face to face.

People who have online teaching experience don't know whether they wish lessons to be always online or not, and those who do not have online teaching experience don't wish the lessons to be always online. People who wish lessons to be always online, rated their level of satisfaction with online teaching as high, and those who don't wish the lessons to be always online, rated their level of satisfaction from online teaching lower, mainly from 4 to 7. People who have online teaching experience tend to advise online teaching to others.

Lecturer responses included the following opinions and suggestions:

- Organise training for lecturers on how to use information technologies, and to teach online learning methods;
- Hybrid learning is more effective, online learning must be organised only when there is a high level of Covid-19 cases;
- Lectures may be online, but seminars are better organised offline;
- To increase control, make students switch on their web cameras;
- Masters degree students learn more effectively during online lessons than bachelor degree students;
- Offline learning is more effective;
- The conscious level of students must be high;
- There are difficulties in assessment of knowledge;
- Not all students have computers at home, many technical problems occur during lessons.

Based on the survey among academic staff it may be concluded, that for many reasons they were mostly not satisfied with online learning, and many steps are needed for overcoming problems.

3. Survey analysis: Students of ASUE

Table 4 summarises demographic information. Notably, 74% of participants were female, and the great majority were undergraduates, mostly in their first or second year.

Table 4: Some information about student participants in the survey (N=783)

	Question	Frequency	%
1. Age in years	18	183	23.4
	19	230	29.4
	20	192	24.5
	21	103	13.2
	22	44	5.6
	23	21	2.7
	24 and older	10	1.3

2. Gender	Male	204	26
	Female	579	74
3. You study in	Undergraduate program	753	96
	Masters program	30	4
	Postgraduate studies	0	0
4. What is your year of study?	1st year	292	37.3
	2nd year	255	32.6
	3rd year	162	20.7
	4th year	74	9.4
5 Your study progress is	Excellent	186	23.8
	Good	444	56.7
	Sufficient	148	18.9
	Bad	5	0.6

Source: Composed by authors based on survey results

Table 5 summarises some information about perceptions from student participants. Notably, the most used system of online learning was Zoom (100% of participants mention it), which aligns with the prominence indicated by staff (Table 2). A preference for in classroom learning (73%), a lack of previous experience with online (71%), and widespread encountering with technical problems (76.9%) are also prominent.

Table 5: Online learning perceptions and experience of student participants
(N=783; *f*=frequency)

Question		*f*	%
1. What do you think is the best way to study?	In classroom (offline)	572	73.0
	Online	67	8.7
	Hybrid	144	18.3
2. Have you ever studied online before the pandemic?	Yes	227	29.0
	No	556	71.0
3. What problems did you encounter while studying online? (participants could mention more than one answer)	Technical problems	602	76.9
	Difficulty in organising discussions at the lesson	294	37.5
	Insufficient computer skills	104	13.3
	Difficulty in understanding the material	315	40.2
	Difficulties in being integrated into the class	398	50.8
	The problem of socialisation	87	11.1
	Knowledge evaluation problems	252	32.3
	Difficulties of using Moodle	65	8.3
	The absence of charter on online learning in the university / not knowing the charter	52	6.6
	Other	6	0.7
4. Would you like the lessons to be online always?	Yes	93	11.9
	No	576	73.6
	I find it difficult to answer	114	14.5
5. Do you think you have learned more through online learning?	Yes	92	11.7
	No	484	61.8
	I cannot say	207	26.4

6. Which systems of online	Zoom	783	100
learning do you use?	Google Meet	66	8.4
(participants could mention	Facebook Messenger	138	17.6
more than one answer)	Google Hangouts	5	0.6
	Viber	98	12.5
	WhatsApp	144	18.4
	Microsoft Teams	35	4.5
	Other (Moodle)	1	0.1

Source: Composed by authors based on survey results.

CSAT and NPS were evaluated also for students. CSAT was 54, which means, that the level of satisfaction with the effectiveness of online learning among students was only 54%, lower than the comparable figure for staff, 65%. With 597 detractors, 86 promoters and 100 passives, NPS was -65%, little different from the staff NPS at -60%.

Students also evaluated their degree of active participation in online learning (listening carefully, asking questions, participating in discussions) on a scale of 1 to 5 (1 = very low, 5 = very high). The average score was 3.2 (N=783) was very similar to the staff response on the same item (3.1, N=169). Student survey participants were given 24 questions (Table 6), which they evaluated according to the level of disagree or agree on a five point scale.

Table 6: Online learning effectiveness level according to the students of ASUE
[SD (strongly disagree)=1; D (disagree)=2; N (to some extent I agree, to some extent no)=3; A (agree)=4; SA (strongly agree)=5; U (undecided, scored 0)] (N=783)

Questions	Number of answers						Av. score
	SD	D	N	A	SA	U	
1. Online lessons are good because they can be recorded	170	60	150	120	87	196	2.82
2. Online learning saves additional time and money on transportation, etc.	190	27	74	175	173	144	3.18
3. Online learning is good because it allows you to focus and not get distracted during the lesson	241	133	75	35	37	262	2.03
4. The online learning schedule is flexible	144	91	131	90	61	266	2.68
5. We participate in the lessons more freely during the online learning	191	132	103	40	45	272	2.25
6. The effectiveness of online learning and classroom lessons is the same	238	150	67	24	28	276	1.92
7. Our computer skills have increased through online learning	160	127	105	78	43	270	2.45
8. Online learning takes more time to learn a lesson than it does in the classroom	157	132	98	64	43	289	2.40
9. It is easier to understand the lesson in online learning than in the classroom	206	157	63	32	23	302	1.98

10. In the case of online learning, the learner's responsibility and self-organisation is greater	187	131	83	45	38	299	2.21
11. In the case of online learning, it is more convenient to study lessons from home	188	87	94	80	62	272	2.49
12. In the case of online learning, technical problems interfere the lesson	154	32	74	151	122	250	3.10
13. In the case of online learning, the lack of face-to-face communication prevents the lesson from being well understood	152	46	90	121	111	263	2.99
14. In the case of online learning, organising group work is difficult	121	63	88	106	96	309	2.99
15. Online learning reduces social networking	136	37	81	120	114	295	3.08
16. In the case of online learning, the competitive environment among students is weak	100	75	78	105	85	340	3.00
17. We are more tired of online learning than classroom lessons	143	66	76	99	102	297	2.90
18. The effectiveness of online learning depends on the extent to which lecturers and students are well used to computer technology	89	81	142	88	66	317	2.92
19. Online learning methods are better	156	117	114	53	31	312	2.33
20. Social isolation has a positive effect on learning lessons	184	141	72	41	28	317	2.12
21. Online learning is more time consuming than classroom learning	150	129	91	56	38	319	2.36
22. Online learning is more stressful than classroom learning	145	91	81	99	60	307	2.66
23. Deviation from classes is common in online learning due to lack of supervision	142	54	73	116	109	289	2.99
24. Assessment of knowledge is more effective in online learning	196	123	85	34	29	316	2.09

Source: Composed by authors based on survey results

From Table 6, some interesting findings may be derived. Higher than average scores could be noted for the following:

- Online learning saves additional time and money on transportation, etc. (3.18);
- In the case of online learning, technical problems interfere with the lesson (3.10);
- Online learning reduces social networking (3.08);
- In the case of online learning, the competitive environment among students is weak (3.00).

Students mostly disagreed with the following.

- Online learning is good because it allows you to focus and not get distracted during the lesson (2.03);
- We participate in the lessons more freely during the online learning (2.25);
- The effectiveness of online learning and classroom lessons is the same (1.92);
- It is easier to understand the lesson in online teaching than in the classroom (1.98);
- Online learning methods are better (2.33);
- Social isolation has a positive effect on learning lessons (2.12);
- Assessment of knowledge is more effective in online learning (2.09).

It may be concluded that students are not well-satisfied with online learning. According to students, the positive sides of online learning are the opportunity to record lessons, flexible schedule, saving time and money on transportation, development of computer skills, also, in the case of online learning, it is more convenient to study lessons from home.

The negative sides of online learning are much more than positive ones. These include: students' participation, concentration and responsibility are lower; students get tired of online learning and it is difficult for them to understand the lesson online as there is no face-to-face communication, which prevents the lesson from being well understood; technical problems may occur; online learning reduces socialisation; organising group work is difficult; the competitive environment among students is weak; online learning methods are not good; online learning is more stressful; knowledge assessment is not effective; and deviation from classes is common in online learning due to lack of supervision.

Cross tabulation and Pearson chi square analysis were done among some factors of the student survey (Appendix 2). The results indicate that there is significant relationship between the factors in the table.

Students who reported active participation in online classes, tended to report higher satisfaction with online learning, wish the classes to be online always, and recommend online learning to others. Also, it is interesting, that there was no significant relationship between having previous online learning experience the level of satisfaction with online lessons. Student mentions of the main problems of online learning included:

- Lack of control, lack of motivation of students, lack of communication;
- Knowledge assessment is not effective and fair;
- Technical problems are obstacles, which don't let students be integrated into lessons;
- Lecturers and students do not know how to use information technologies;
- Not all subjects are easy to understand during online learning;
- During online learning the students must have access to library resources;
- Online learning is good only when there is no chance to organise lessons offline because of high levels of Covid-19 cases, but in other conditions, only offline learning is effective;

- We get tired easily during online learning, so the classes should be shorter;
- Getting practical skills is difficult during online lessons;
- Not all students have computers at home, Internet connection, etc.;
- Students switch on online lessons without showing web cameras, and they just show that they are present, without participating in the lesson;
- Students cheat lecturers by reading the lesson;
- We pay high amount of money to have quality education, which is impossible in online learning;

In some cases, hybrid learning method may be used.

So, the best way to solve the problems is to increase the level of control, train lecturers on how to teach online, and to organise online lessons only in case of a high level of Covid infections, as they are not as effective as offline lessons.

Conclusion and recommendations

The literature review has revealed that for many countries online learning is stressful, and they were not ready for the fast shift to online learning, which proved also to be the case for Armenia. This study's survey analyses revealed many interesting findings. It showed that for academic staff of ASUE the best way to teach is offline teaching in classrooms (54%) and hybrid way of teaching (both offline and online, 45.5%). For students, the best way to study is offline learning in classrooms (73%) and hybrid way of learning (18.3%). The level of satisfaction with the effectiveness of online learning among academic staff is 65% and among students is only 54%; Net Promoter Score of academic staff is (-60%), and NPS of students is (-65%). So, the satisfaction level of students is a little lower. According to academic staff, the degree of active participation of students in online learning (listening carefully, asking questions, participating in discussions) on a scale of 1 to 5 is 3.1, according to students it is very similar at 3.2.

The survey has revealed many positive and negative sides of online learning for students and lecturers. The positive sides of online learning include the opportunity for recording lessons; flexible schedule of lessons; saving time and money on transportation; increase in computer skills; absence of noise; and it is more convenient to study lessons from home. The negative sides of online learning for both students and lecturers include students' participation and responsibility are lower; online learning is more tedious and stressful; lack of face-to-face communication and socialisation; lack of control; a weak competitive environment among students; difficulty in assessment of knowledge; organising discussions and group work; difficulty in using interactive methods; and widespread problems connected with technical issues, and not knowing how to use digital technologies.

The universities should take steps for solving the revealed problems. First of all, lecturers should be trained on how to use digital technologies online learning tools. Student groups should be divided into smaller groups which will enable them to better organise discussions, and use interactive methods more effectively. As assessment of knowledge is

not easy and students feel that their marks are not fair, better methods of knowledge assessment could be based on discussions, case studies and tests for which students will not be able to read from their computers.

Sudden turning to online learning revealed that not all processes may be organised effectively if there is no previous experience in online learning, as online learning needs online platforms, knowledge evaluation systems, and other components. Many universities have online courses, which are online all the time, even exams and final exams may be online. For ASUE this survey may give practical recommendations for establishing online learning platforms for some disciplines, though only after training and problem solving activities.

A limitation of this study is that the survey was done in only one university, so similar further studies are needed in other universities, nationally in Armenia and regionally wider, to refine the identification of shortcomings and gaps in using online learning, and the methods of investigation, especially including greater use of corroborating evidence from qualitative methods. However, the main issues are common and all universities have faced these problems. Further progress towards more effective organisation of online learning during a pandemic or post-pandemic is very likely dependent on how well all participants have learnt from the Covid-19 experience.

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Appendices

Appendix 1: Pearson chi square analysis results - academic staff of ASUE

Factors	Pearson chi square	
	Value	Sig.
Years of teaching experience * Satisfaction level with online teaching	42.607	0.029
Years of teaching experience * Wishing the lessons to be always online	14.633	0.023
Online teaching experience * Wishing the lessons to be always online	10.215	0.006
Satisfaction level with online teaching * Wishing the lessons to be always online	69.379	0.000
Satisfaction level with online teaching * Advise online learning to others	240.366	0.000
Online teaching experience * Advise online learning to others	17.012	0.049
Wishing the lessons to be always online * Advise online learning to others	68.970	0.000

Source: Composed by authors based via *SPSS* software.

Appendix 2: Pearson chi square analysis results - students of ASUE

Factors	Pearson chi square	
	Value	Sig.
Satisfaction level with online learning * Wishing the lessons to be always online	301.698	0.000
Satisfaction level with online learning * Advice online learning to others	957.314	0.000
Wishing the lessons to be always online * Advice online learning to others	524.302	0.000
Degree of active participation in online learning * Satisfaction level with online learning	469.432	0.000
Degree of active participation in online learning * Wishing the lessons to be always online	125.024	0.000
Degree of active participation in online learning * Advice online learning to others	341.199	0.000
Getting more knowledge through online learning * Wishing the lessons to be always online	391.000	0.000
Getting more knowledge through online learning * Satisfaction level with online learning	386.713	0.000
Getting more knowledge through online learning * Advice online learning to others	541.335	0.000

Source: Composed by authors based via SPSS software.

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