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The Effect of Blended Learning on the Achievement in a Physics Course of Students of a Dentistry College: A Case Study at Ajman University

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Abstract: This study aims to investigate the impact of the use of blended learning on the achievement of Dentistry College students on a physics course at Ajman University. It compares the results of different ways of teaching the 'Practical physics course'. The study was conducted using a quasi-experimental case study design. The participants of the study were 116 students, divided into two groups: one an experimental group (n = 59) and the other a control group (n = 57). An achievement test was designed to confirm the study's validity and reliability. SPSS was used to analyze the data. The findings revealed that there were statistically significant differences between the experimental and the control groups, in favor of the experimental group. Moreover, the findings also revealed that achievement varied according to the gender of the students in the experimental group (in favor of females). The study recommends further research into the use of blended learning in higher education institutions.

Keywords: achievement, blended learning, effect, Dentistry College students, Ajman University

1. Introduction

The current historical moment is witnessing a revolution in technological advances in all areas of life, and particularly in the field of education, where technology has made a range of new teaching methods possible. Blended learning is one of these, and is now widely used in educational institutions such as universities and schools (Means, Toyama, Murphy, Bakia, and Jones, 2010; Roseth, Akcaoglu, and Zellner, 2013). E-learning started as computer-based courses in the 1980s and 1990s, on stand-alone disk drives. Later, educational courses were hosted on internal networks and then transferred to learning management systems (LMSs) in the late 1990s (Joseph and Nichlavose, 2019). Traditional education is undoubtedly now threatened by the prevalence of rapid e-learning because of its multiple advantages, which makes everyone accept it. Firmansyah and Timmis (2016) pointed out that, in 2012, a new innovation in education called massive open online courses (MOOC) was launched into the globe, which is an online learning course aimed at unlimited participation and open access via the web. Additionally, Beaven, Codreanu and Creuzé (2014) point out that the largest MOOC suppliers are based in North America, Australia, and Europe, with learners from across the globe enrolling in prestigious university courses. Coursera, an online learning platform established in 2012, offers specializations and degrees. It is a for-profit educational technology company (Pomerol, Epelboin and Thoury, 2015). Al Hadhrami and Al Hadhrami (2018) pointed out that e-learning nowadays indicates everything provided for the obvious aim of educating that is allowed or mediated by electronic technology. Additionally, the authors believe that the success of the achievement of the e-learning education system depends on the educational environment in which it operates. Agrawal, Agrawal and Agarwal (2016) identify six factors affecting the efficacy of e-Learning (Figure 1).

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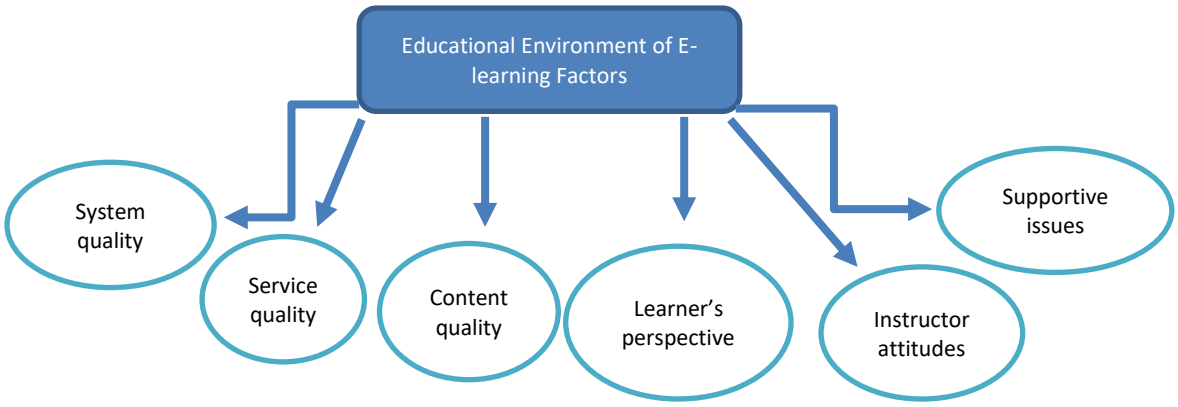

Figure 1: Educational Environment of E-learning Factors

According to Deepali, Wadhai and Thakare (2016), e-learning has become more popular in nations with significant socio-economic variations among the population and growing demand for learning with the appearance of smartphones and tablets and other devices. It was also defined by Park and Jo (2018) as offering learning and training through web network interaction and availability of technologies with the accessibility to knowledge and data. The implementation of e-learning in education provides several benefits, such as flexibility in terms of time and site of the education received. It increases the efficiency of awareness and understanding by making a greater amount of information easily accessible. Also, in e-learning, learners are therefore not forced to depart and it won't cost them large amounts of money. It also takes into consideration the differences between students during the teaching process (Agarwal, 2013; Arkorful and Abaidoo, 2016). Blended learning combines traditional learning with e-learning, and is also a more cost-effective teaching/learning method (Güzer and Caner, 2014; Oweis, 2018).

1.1 Definition of Blended Learning

Nowadays, researchers recognize that there are both advantages and drawbacks to both face-to-face, traditional learning environments and online learning environments (Mortera-Gutierrez, 2006). In an attempt to focus on the benefits of the two different educational approaches and reduce the disadvantages, researchers have started to combine components of them. As a consequence of this, 'blended learning' emerged as a modern instructional model that can combine educational methods to achieve desired educational objectives (Sarıtepeci and Çakır, 2015).

The blended learning model is now being implemented through several higher education organizations to improve the quality of teaching, ease in access to information and educational cost, since technologies and the web are used as teaching techniques to enhance teaching objectives and therefore the educational performance of students (Oweis, 2018; Tongchai, 2016).

Most researchers have confirmed that blended learning is a contemporary and modern approach that combines different models of traditional and online or distance learning and utilizes various types and media of technology, leading to enhanced communication and interaction between teachers and learners, which means that it is a combination of e-learning or distance learning with direct or traditional, face-to-face educational environments (Alsalhi, Eltahir and Al-Qatawneh, 2019; Goyal and Tambe, 2015; Graham, 2013; Isti'anah, 2017; Moskal, Dziuban and Hartman, 2012). Therefore, we can describe blended learning as a contemporary educational approach that combines traditional education in its different types with e-learning in its different designs to enhance learner engagement and outcomes. Thus, the definition of blended learning can be clarified as shown in Figure 2.

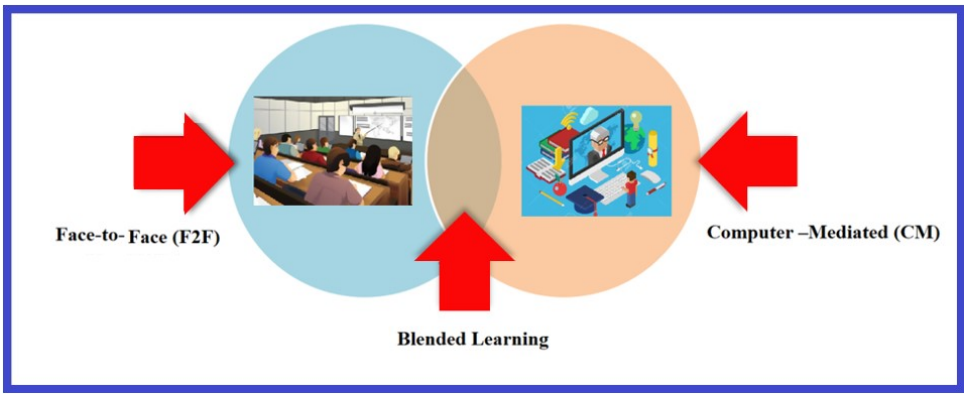

Figure 2: Blended learning definition (Graham, Allen and Ure, 2003; Graham, 2013)

Researchers (Du, 2011; Khan, et al., 2012; Stapa, Ibrahim and Yusoff, 2015) have made some comparisons between blended learning and traditional learning. Table 1 illustrates these comparisons:

Table 1: Comparisons between Blended Learning and Traditional Learning

Comparison Item	Blended Learning	Traditional Learning
Place of application	Any place and flexible	Classrooms fixed and not elastic
Approach of learning	Online and face-to-face	Face-to-face
Learning time	Flexible timing, available at any time	Inelastic and at a certain time
Use of technology	The use of technology is essential and obligatory	No compulsory use of technology
Online support	Conversations, applying online tasks, determining on online missions	None
The education materials	Instructor, group of instructors	Instructor
Assignments	Individual, group	Individual, group

According Ellis, Steed and Applebee (2006) and Moskal, Dziuban and Hartman (2012), in educational institutions such as universities and schools, teachers and faculty use mixed learning because of the benefits it offers. Such benefits include:

- It promotes the cooperation and learning of learners.
- It is project-based education, and is concentrated on problem-solving.
- It decreases the time expended in the schoolroom, and tends to make the use of study time more productive.
- Learners are all much more productive and innovative, and better prepared.
- It is an evolving, responsive, and dynamic approach.
- It is more interesting for students, and potentially offers education from many learning sources while providing the highest performance at the cheapest cost.

On the other hand, Bernard, Borokhovski, Schmid, Tamim and Abrami (2014) refer to how much of the course should be face-to-face and how much online during teaching through the blended learning approach, saying that most courses require the online component to be at least 20–30 percent but not more than 70–80 percent. Furthermore, McSporran and Kind (2005) and Tselios, Daskalakis and Papadopoulou (2011) noted that success factors in blended learning can be due to the design of the blend, the flexibility of time, and an appropriate blend of multimedia with education strategies.

1.2 Blended Learning in Higher Education

The determination of which learning methods and study conditions should be used was one of the most significant problems affecting the quality of education in higher education organizations (Lee and Im, 2014). Moreover, detecting the adoption and implementation of blended learning in higher education institutions is challenging, since departments and teaching staff have direct control over their content and teaching methods (Picciano, Seaman and Allen, 2010).

Bonk and Graham (2006) reported that 93% of their study participants in higher education provided blended learning, although more than 60% do blended learning for less than 20% of their classes or courses. Moreover,

managers, administrators, and faculty members of higher education institutions expect more adoption and application of blended learning in the future (Parsad and Lewis, 2008). Furthermore, Osgerby (2013) reported that 12% of the 12.2 million distance courses registration were given in blended formats. Further, since 2014, institutions of higher education provided 70.7% of their courses in blended learning formats.

1.3 Models of Blended Learning in Higher Education

There is no one way to blend learning; online and face-to-face instruction can be combined into several blended learning models. Several blended models have been formed over the past several years: often the bulk of learning is provided in the teaching hall while some extra activities are provided online. Most of the courses are provided online in many other cases. Perhaps occasionally a student gets to choose which activities to complete online and which to complete in a teaching hall (Spring and Graham, 2017). Our review of studies observed by previous researchers revealed some models of blended learning in higher education, as illustrated in Figure 3 (Kudryashova, Gorbatova and Rozhkova, 2016; Lisetskyi 2015; Staker and Horn, 2012):

- **Face-to-Face Driver Model:** the largest percentage of the curricula involve an interaction between learners and a teacher, such as the flipped classroom model.
- **Station Rotation Model:** allows students, within a given course and schedule, more movement between learning online in a one-to-one, self-paced environment and sitting in a classroom with a traditional face-to-face teacher.
- **Online Lab Model:** includes online courses offered at a specific site through computer lessons. In this model, the laboratory assistant is responsible for supervision. Furthermore, the students have the chance to learn in a traditional learning environment.
- **Self-Blend Model:** gives students the chance to pick extra courses in addition to their main ones, which are provided by various educational institutions. Students require high motivation for this model to succeed.
- **Online-Driver Model:** includes an online platform and a teacher who delivers the entire curriculum.
- **The Flex Model:** authorizes learners to be flexible with their timetable among learning activities, depending on their requirements. Moreover, within the flex model, digital education is seen as the foundation of learners' teaching and learning.

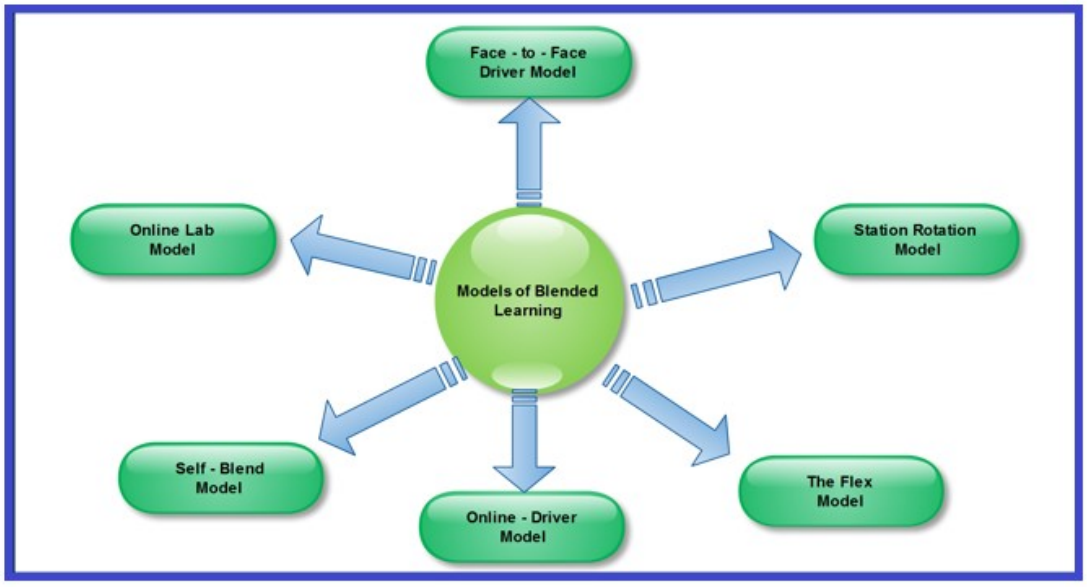

Figure 3: Models of blended learning (Kudryashova, Gorbatova and Rozhkova, 2016; Lisetskyi 2015; Staker and Horn, 2012)

1.4 Previous Studies

Many previous studies have already shown that blended learning is acquiring significance in learning and teaching, particularly in higher education. The American Society for Training and Development (ASTD) decided that blended learning has been one of the top ten models in the information and knowledge delivery sector (Rooney, 2003).

In educational institutions such as universities, blended learning and its impact on student achievement has been studied extensively. Several blended learning studies revealed that the blended learning methodology has beneficial effects on student performance, engagement, and involvement in the learning process, and the grades obtained by the learners have improved since the implementation of blended learning, indicating that a combination of traditional teaching and online techniques is useful to the learners (Ahmed, 2011; Al-Hasan, 2013; Almasaeid, 2014; Chen and Jones, 2007; Dowling, Godfrey and Gyles, 2003; Khader, 2016; Kagohara, et al., 2010; Lança and Bjerre, 2018; McLaughlin, et al., 2015; Qutieshat, Abusamak and Maragha, 2019).

Universities have carried out extensive research on blended learning. Such research results showed that mixed learning is more effective than conventional learning and that students have demonstrated increasingly positive attitudes toward and engagement with blended learning. Furthermore, the results indicate that the use of technology and multimedia such as audio files (mp3), videos, Encarta encyclopedia, and simulations programs may have benefits over the traditional curriculum content, particularly for complicated and difficult concepts (Akbarov, Gonen and Aydogan, 2018; Akkoyunlu and Soylu, 2008; AlQahtani, 2015; Bakeer, 2018; Boyle, et al., 2003; Chen and Jones, 2007; Dowling, Godfrey and Gyles, 2003; Ja'ashan, 2015; Lança and Bjerre, 2018; Okaz, 2015; Pereira, et al., 2007; Vernadakis, et al., 2012). In comparison, there are also other studies whose findings revealed that the use of blended learning had no important impact on the achievement of students (Isti'anah, 2017; Kazu and Demirkol, 2014; Tosun, 2015; Wei, et al., 2017). The researchers summarized these studies in three groups, shown in Table (2).

Table 2: A summary of previous studies

Classification Group	Previous Studies of Group	Aim of Studies	Main Results
Group (A)	(Ahmed, 2011; Al-Hasan, 2013; Almasaeid, 2014; Chen and Jones, 2007; Dowling, Godfrey and Gyles, 2003; Khader, 2016; Kagohara, et al., 2010; Lança and Bjerre, 2018; McLaughlin, et al., 2015; Qutieshat, Abusamak and Maragha, 2019).	Examining and exploring the impact of blended learning on academic achievement and students' performance.	The students' achievements have been improved and their performance developed.
Group (B)	(Akbarov, Gonen and Aydogan, 2018; Akkoyunlu and Soylu, 2008; AlQahtani, 2015; Bakeer, 2018; Boyle, et al., 2003; Chen and Jones, 2007; Dowling, Godfrey and Gyles, 2003; Ja'ashan, 2015; Lança and Bjerre, 2018; Okaz, 2015; Pereira, et al., 2007; Vernadakis, et al., 2012).	Identification and exploration of the effect of blended learning on student engagement and their attitudes towards using it.	Students' have demonstrated increasingly positive attitudes and engagement toward blended learning.
Group (B)	(Isti'anah, 2017; Kazu and Demirkol, 2014; Tosun, 2015; Wei, et al., 2017).	Investigating the effect of blended learning on students' achievement.	The use of blended learning had no significant impact on student achievement.

1.5 Study's Purpose

This study seeks to investigate the effectiveness of using the blended learning approach to improve the achievement of Dentistry College students on a physics course during the spring semester of 2018/2019

1.6 Significance of the Study

The findings of the study are expected to be useful for the following purposes:

- Faculty members will be more convinced of and enthusiastic about implementing blended learning in their universities.
- This research will also make a modest contribution to the literature on methods for use when teaching physics in universities.
- The results of the study may be of interest to academics at universities by providing them with suggestions for the use of a blended learning approach.

1.7 Limitations and Issues

The findings of several educational institutions in numerous countries across the world have demonstrated the effectiveness of utilizing blended learning. Academic institutions such as Harvard University in the United States and Cambridge University in the United Kingdom have implemented various models of blended learning that have encouraged numerous learners to register for and join these courses. Nevertheless, given the fact that research suggests the significance and requirement of implementing blended learning in higher education, it has still not gained enough interest in Middle Eastern institutions, particularly in Arab countries' universities, which still depend on conventional learning.

This would be the justification for why this research has chosen to investigate the results of utilizing blended learning to boost the achievement of Dentistry College students on a physics course. Therefore, this research aims to address the following questions:
RQ1. Does the use of blended learning improve the achievement of dentistry college students in a physics course?
RQ2. Does the achievement of dentistry college students while using blended learning vary according to the gender of the students?

1.8 Hypotheses of the Study

The researchers formulated null hypotheses, which are as follows:

- There are no statistically significant differences between the mean scores of the experimental group, who used the blended learning in their studies, and the mean scores of students in the control group who studied using the traditional education, in the post-achievement test.
- There are no significant differences in achievement of Dentistry College students in the experimental group while using blended learning, attributable to the variable student gender.

1.9 Terms of Study

- *Achievement:* The outcome of what learners studied, at the completion of the course of tuition, evaluated by achievement in exams (Elfaki, Abdulraheem and Abdulrahim, 2019).
- *Blended learning:* A method that combines two distinct forms of learning, online learning and conventional learning (Bonk and Graham, 2006). In addition, blended learning is characterized as a mixture of physical and virtual environments.
- *Effect:* The shift that occurs when something happens: an occurrence, event or condition that is the product of a specific cause (Ishmirekha, 2017).

2. Methodology

We used a quasi-experimental approach because of its adequacy for the research. Another possible explanation for its use is its ability to achieve its objective through the use of a post-achievement test for experimental and control groups. The experimental design of the study is shown in Figure 4.

In the control group, the Dentistry College students were taught the physics course using direct traditional teaching. At the same time, the students in the experimental group were taught the same course topics, but using blended learning. In other words, the same teaching topics were taught to both groups of students for the same time during the spring semester of the academic year of 2018/2019. The teaching topics were as shown in Table 3.

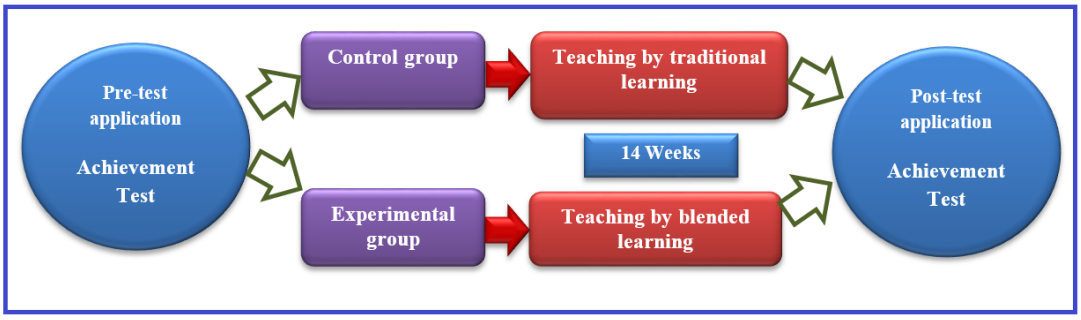

Figure 4: Experimental design of the study (researcher's own design)

Table 3: Teaching Topics in the Physics Course

Topics	Number of times per week
1: Motion in straight line at constant acceleration	1
2: Newton's laws	2
3: Newton's law of gravity, the law of energy conservation, torque & static equilibrium	2
4: Moment of inertia	2
5: Laser and X-ray, properties and applications	2
6: Light reflection and refraction	2
7: Electric charge, Coulomb's law and electric potential	2
8: Thermodynamics	2
Total number of weeks	14

2.1 Research Participants

The participants of this research consisted of 116 students studying in the Dentistry College.

They were divided into an experimental group (n = 59) and a control group (n = 57). The study was carried out during the spring semester of the academic year of 2018/2019. Table 4 shows the demographic information for the participants.

Table 4: Demographic Information of Participants

Group	Number		Percentage (%)	Total
Experimental	59		(51 %)	(116) 100%
Control	57		(49 %)	
Gender	female (65)		56 %	(116) 100%
	Control	Experimental		
	32	33		
	male (51)		44%	
	Control	Experimental		
	25	26		

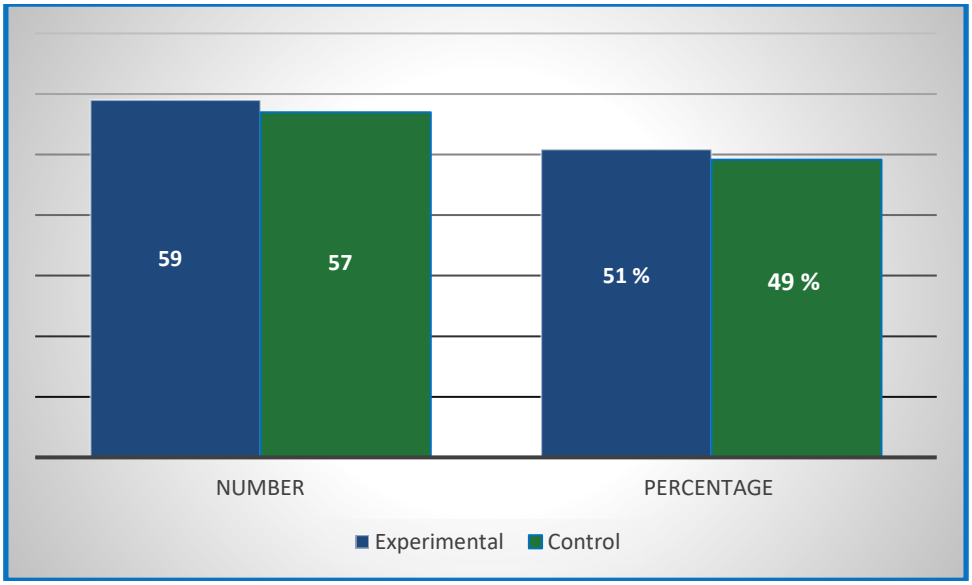

Figure 5: Number and Percentage of the Participants in the experimental and control groups

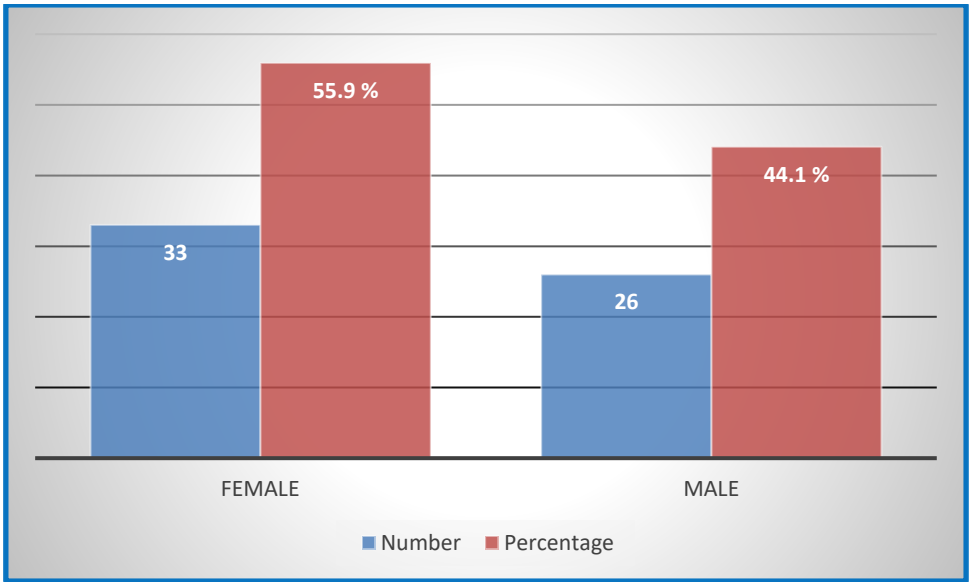

Figure 6: Number and Percentage of the female and Male Participants in the experimental group

2.2 Study Variable

- *Independent variables*, which were the two teaching methods:

1. Blended learning strategy
2. Traditional method
3. Pre-test (before intervention)
4. Post-test (after intervention)
5. Demographic information for participants (gender)

- *Dependent variables*: Achievement scores of students of study groups measured on two occasions (pre-test & post-test)

2.3 Study Tools

The researchers reviewed previous studies and literature on the subject (for example, Ahmed, 2011; Al-Hasan, 2013; Kudryashova, Gorbatova and Rozhkova, 2016; Maccoun, 2016).

2.3.1 Educational material

The authors prepared and organized the topics for the physics course and the activities that pertained to it and put them into the Model of Learning on the Ajman University website, which is called the Ajman University Learning Management System, at the web address: https://mylms.ajman.ac.ae/login/index.php. It was made available for use in blended learning for teaching the experimental group. Meanwhile, in the control group, the topics were taught via face-to-face learning in a classroom environment without using a learning model.

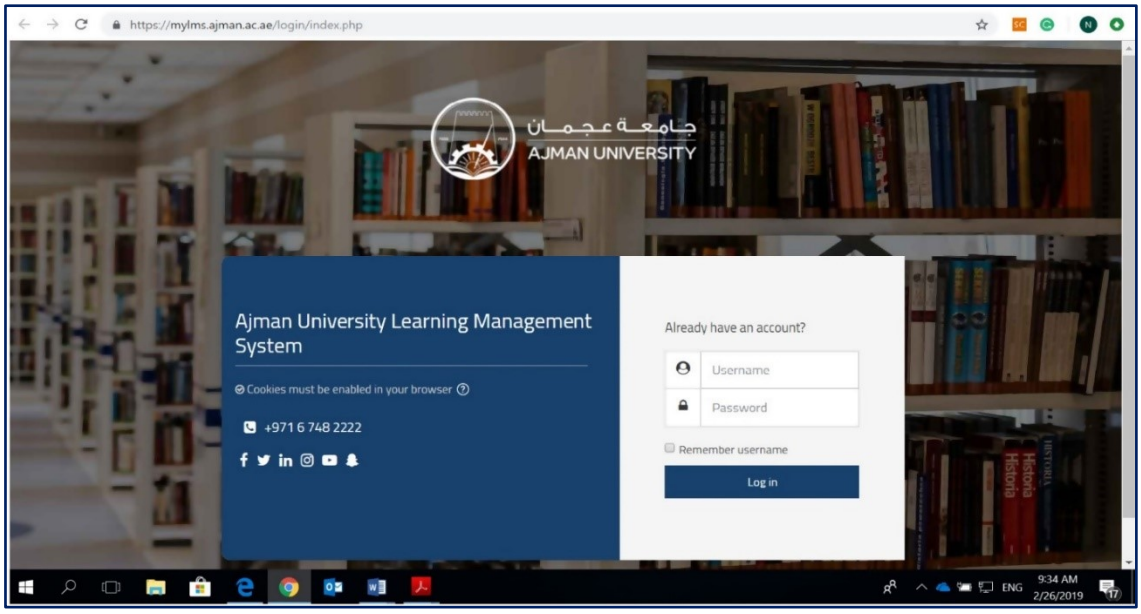

Figure 7: Homepage of Ajman University's Learning Management System Website

All the students logged in to the home page of the learning model by providing the necessary information (their user names and passwords) (see Figure 7). The site contained the topics, PowerPoint presentations, activities, videos, YouTube links, homework sheets, and short online quizzes.

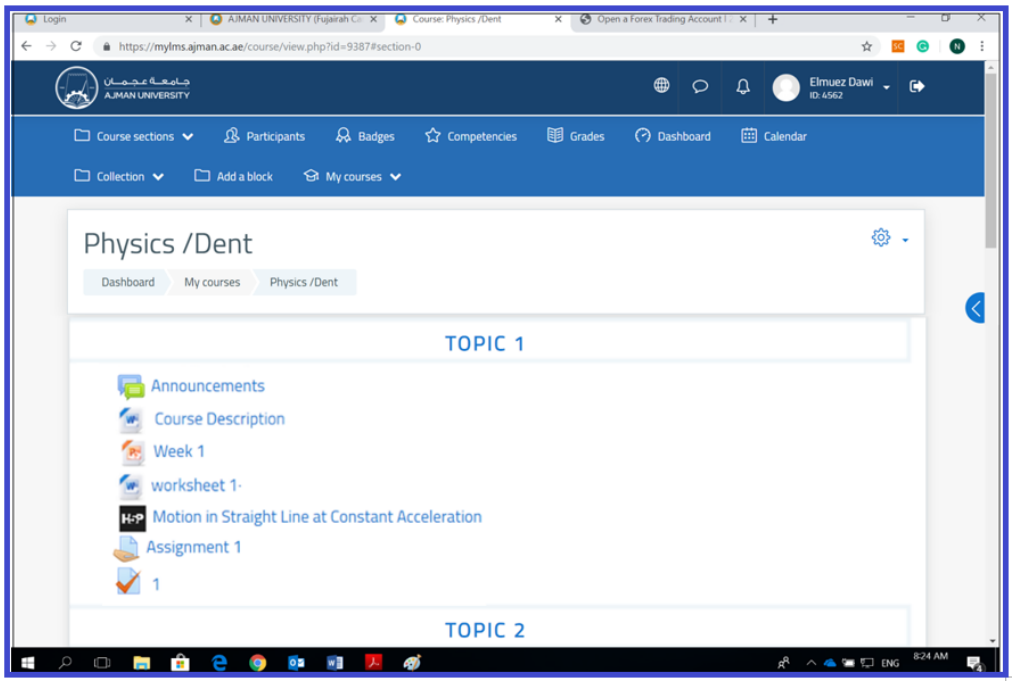

Figure 8: Course screen

When the students began the course using the model, they were presented with the course screen. It consisted of a number of parts (see Figure 8). For example, if the students were asked to go through the learning model

to study the first topic (Motion in Straight Line at Constant Acceleration), they would study this topic using the following parts: lecture presentation, YouTube, worksheet, activity, and an online quiz that formed part of this topic, as shown in Figure 7. For example, if the students opened the lecture presentation of Week 1, the presentation title would be addressed by the same topic that illustration of Motion in Straight Line at Constant Acceleration (see Figure 9)

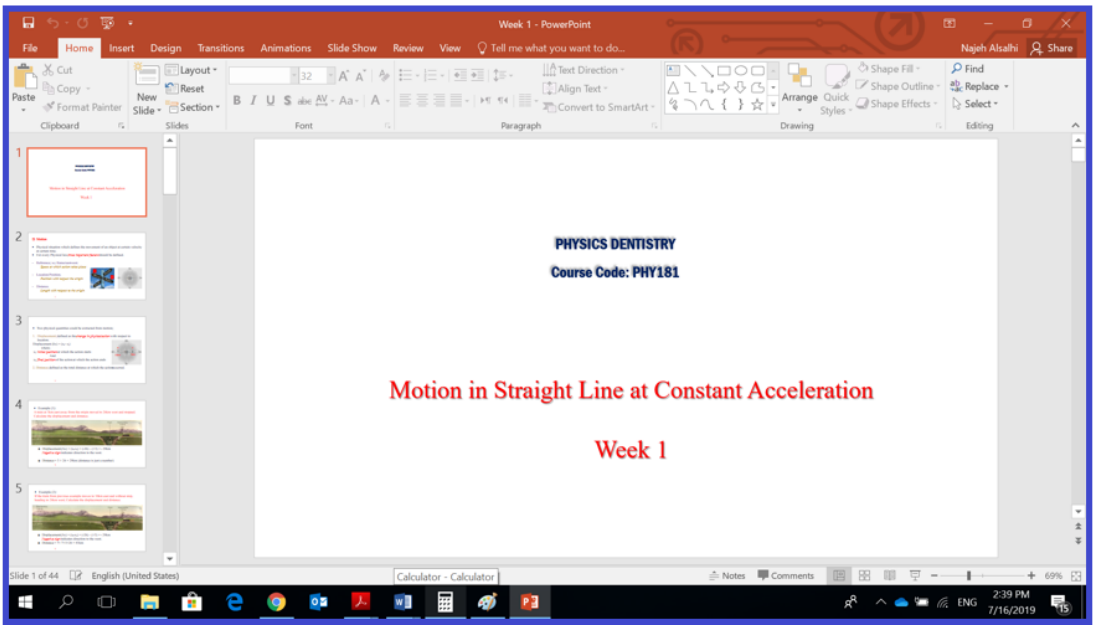

Figure 9: Lecture presentation of Week 1

Students were also directed to watch uploaded videos on the webpage, and the students were very active, posting critical reviews of the videos.

2.3.2 Achievement test

The researchers prepared an achievement test, to measure the blended learning's effectiveness in improving the students' results. The test was prepared according to Bloom's taxonomy of cognitive domains (Hyder and Bhamani, 2016). Further to that, we prepared a specification table for this test (see Table 5). In its final version, the test consisted of 20 multiple-choice questions. Each question item was given one mark for a correct answer and zero for a wrong answer. The maximum possible mark for the test was 20 and the testing time was 60 minutes.

Table 5: Specifications for the test of the topics

Topics	Number of lectures	Relative weight of topics	LOT questions	HOT questions	Total of questions
Motion in straight line at constant acceleration	2	6.7	1	0	1
Newton's laws	4	13.3	2	1	3
Newton's law of gravity, the law of energy conservation, Torque & Static Equilibrium	5	16.7	3	2	5
Moment of inertia	3	10.0	1	1	2
Laser and X-ray, properties and applications	3	10.0	2	0	2
Light reflection and refraction	4	13.3	1	1	2
Electric charge, Coulomb's law and electric potential	6	20.0	2	1	3
Thermodynamics	3	10.0	1	1	2
Total	30	100.0	13 (65%)	7 (35%)	20

*LOT = lower order thinking: remembering, understanding, and applying.
*HOT = higher order thinking: analyzing, evaluating, and creating.

1. Validity of achievement test
   The achievement test was confirmed as a valid virtual testing method by submitting it, in its initial form, to members of the teaching staff at universities where doctorate and master's degree curricula include methods of teaching science courses and education technology. We deleted some of the questions and added others following their recommendations and suggestions, and thereafter the test was considered valid.
2. Reliability of achievement test
   The researchers verified the reliability of the achievement test by using the test-retest method. We ran the test on a sample from outside of the study sample. Two weeks after first applying the test, it was re-applied to the same sample of dentistry college students. After that, the Pearson correlation coefficient between the two applications was calculated, wherein the total reliability coefficient (0.81) was considered appropriate for the purposes of this study.

2.4 Pre-Test

In order to examine the equivalence of the achievements of the dentistry college students in the two study groups, the researchers used a "t-test" to compare the results of the pre-test on the topics of the physics course, before introducing blended learning into the experimental group, as shown in Tables 6 and 7, below.

Table 6: Means and standard deviations of pre-test scores for the two groups

Group	N	Mean	Std. Deviation
Experimental	59	11.97	1.29
Control	57	11.67	1.11

Table 7: T-test results of pre-test between the experimental and the control groups

	Levene's test for equality of variances		t-test			
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Equal variances assumed	0.080	0.778	1.342	114	0.182	0.29944
Equal variances not assumed			1.345	112.535	0.181	0.29944
* Statistically significant at (p<0.05)						

As shown in Table 7, the obtained p (0.182) is greater than 0.05; therefore, the test is not significant at the 0.05 level, which indicates that there is no significant difference between the two studied groups. This proved that the experimental and control groups were equivalent, before the study was begun.

2.5 Procedures

The following procedures were followed:

- Preparation of educational materials for all topics in the Physics course. This included PowerPoint presentations, lectures, activities, videos, YouTube links, homework sheets, and short online quizzes, which were placed on the Model of Learning website.
- The researchers taught students of the experimental group how to use the Model of Learning website.
- The achievement test was prepared according to Bloom's taxonomy of cognitive domains (Hyder and Bhamani, 2016), and the educational objectives of the course.
- The specification table for the achievement test was prepared.
- The study participants were divided into two groups: the experimental group consisting of 59 students, who were taught through blended learning, and the control group consisting also of 57 students, who were taught using the traditional method.
- Teaching for both the experimental and the control group was conducted through the spring semester 2018/2019, for a period of 14 weeks and at a rate of two periods per week, each lasting one and a half hours.

- A post-test was applied to the two groups (experimental and control), which aimed to measure the improvement of students in the experimental group, immediately after completing the educational aspects of the material.
- Results were collected and analyzed statistically.

2.6 Statistical Treatment

The researchers used the SPSS program to analyze the answers to the research questions. We made our calculations through arithmetical means and standard deviations. A t-test independent sample was used to measure the statistical differences in means between the experimental and the control groups in the results of the post-test.

3. Results

3.1 Findings Related to RQ1

The first research question was: Does the use of blended learning improve the achievement of dentistry college students in a physics course?

In order to answer the first question of this study, the following null hypothesis was tested:

There are no statistically significant differences between the mean scores of the experimental group, who used the blended learning in their studies, and the mean scores of students in the control group who studied by using the traditional education, in the post-achievement test.

In order to verify the hypothesis, the difference between the mean scores of students in the experimental and the control groups on the post-test of achievement was calculated using a t-test for two independent samples.

The results are shown in Table 8.

Table 8: Means and standard deviations of post-test scores for two groups

Group	N	Mean	Std. Deviation
Experimental	59	16.53	1.72
Control	57	14.09	1.56

As shown in Table 8, the students who were taught with blended learning had different scores (M = 16.53, SD = 1.72) than those who were taught through traditional face-to-face learning (M = 14.09, SD = 1.56).

Table 9: The independent sample t-test results of post-test

	Levene's test for equality of variances		t-test			
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Equal variances assumed	2.094	0.151	7.995	114	.000	2.43770
Equal variances not assumed			8.008	113.603	.000	2.43770
* Statistically significant at ($p < 0.05$)						

As shown in Table 9, since the obtained p-value (0.000) is smaller than 0.05, this means there are significant differences at the 0.05 level, which indicates that there is a significant difference between the groups, in favor of the students of the experimental group. This means the null hypothesis is rejected. Based on the results of this test, it can be concluded that using blended learning to teach a Physics course to Dentistry College students has a positive impact on the Dentistry students' achievement.

3.2 Findings Related to RQ2

The question was: Does the achievement of dentistry college students while using blended learning vary according to the gender of the students?

To answer the second research question of the study, the following null hypothesis was tested:

There are no significant differences in achievement of Dentistry College students in the experimental group while using blended learning, attributable to the variable student gender.

In order to verify the hypothesis, the difference between the mean scores for the post-test of achievement of male and female students in the experimental groups was calculated using a t-test for two independent samples. The results are shown in Table 10.

Table 10: Means and standard deviations of post-test scores for two groups

Experimental Group	N	Mean	Std. Deviation
Female	33	17.27	1.35
Male	26	15.58	1.68

As shown in Table 10, the female students who were taught with blended learning had different scores (M = 17.27, SD = 1.35) than female students (M = 15.58, SD = 1.68).

Table 11: The independent sample t-test results of post-test

	Levene's test for equality of variances		t-test			
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Equal variances assumed	.005	.945	4.300	57	0.000	1.69580
Equal variances not assumed			4.192	47.447	0.000	1.69580
* Statistically significant at (p<0.05)						

As shown in Table 11, since the obtained p-value (0.000) is smaller than 0.05, which means there are significant differences at the 0.05 level, this indicates that there is a significant difference between the dentistry students in the experimental group in favor of female students. This means the null hypothesis is rejected. Based on the results of this test, it can be concluded that the achievement of the students' in the experimental group varied according to gender (in favor of females).

4. Discussion

The obtained results, for the first research question, are shown in Table 8, and concern the effect of the use of blended learning on improving the achievement of dentistry students on a Physics course. The results indicated that there was a significant difference between students in the experimental and the control groups, in favor of the students in the experimental group. If we examine the results shown in Table 8, we find that the average of post-test scores, for students in the experimental group who were taught with blended learning, is 16.53, compared to 14.09 for the control group who were taught with traditional learning. Additionally, as seen in Table 9, since the acquired p-value (0.000) is less than 0.05, this implies there are significant differences at the significance level of 0.05, which confirmed that there is a significant difference between the two groups of learners in their understanding of physics course topics. This indicates that blended learning had a positive effect on increasing the achievement of undergraduate students in the physics course topics and skills. This may point out that blended learning has had a positive impact on increasing the achievement of higher education students. This may confirm that blended learning has a positive effect on the achievement of dentistry students' when compared to traditional learning. The result can be explained according to researchers' by the fact that students in the experimental group have a chance to learn through an interactive, interesting and motivating way of interacting with physics topics with the ability to expand the acquisition of information from a variety of sources, making them more academic achievement.

This result is consistent with previous studies that examined the effect of blended learning on the academic achievement of learners by comparing traditional learning in different educational institutions, like universities and schools (Ahmed, 2011; Al-Hasan, 2013; Akbarov, Gonen and Aydogan, 2018; Akkoyunlu and Soylu, 2008; Almasaeid, 2014; AlQahtani, 2015; Bakeer, 2018; Boyle, et al., 2003; Chen and Jones, 2007; Dowling, Godfrey and Gyles, 2003; Ja'ashan, 2015; Kagohara, et al. 2010; Khader, 2016; Lança and Bjerre, 2018; Maccoun, 2016; McLaughlin, et al., 2015; Okaz, 2015; Pereira, et al., 2007; Shahin, 2008; Vernadakis, et al., 2012). Where the

results of these studies referred that students who studied through a blended learning approach became more understanding, productive and innovative, and better readiness to learn, which led them to gain better scores and improvement of their academic achievement. The findings have confirmed that blended learning has provided students more energy, inspiration, and enthusiasm for learning because of its features such as flexibility of applied, the flexibility of time, online and face-to-face use, and online submission of assignments, and deciding assignments online. Moreover, the results of this study did not agree with the results of other studies which found that the use of blended learning had no significant effect (Isti'anah, 2017; Tosun, 2015; Wei, et al., 2017).

The second research question concerned whether the achievement of Dentistry College students of the experimental group varied according to the gender of the students. To answer this question, the second null hypothesis was tested. Firstly, we postulated that there would be no statistically significant differences between the mean scores of the female and male students in the experimental group in the post-achievement test. We applied a t-test for two independent samples to verify the hypothesis, and the difference between the mean scores of male and female students in the experimental group on the post-test of achievement was calculated. The results are shown in Tables 10 and 11. These show that the average of the post-achievement test for the female students in the experimental group was 17.27, whereas that for the males was 15.58. Additionally, there was a significant difference ($t(57) = 4.300$, $p < .05$), which means that the null hypothesis was therefore rejected and our results confirmed that there are statistically significant differences in the achievement of students in the experimental group according to gender, in favor of females. This result agrees with the results of Alsalhi, Eltahir and Al-Qatawneh, 2019; Almasaeid, 2014; AlQahtani, 2015; Khader, 2016). Researchers may attribute this, from their point of view to females who may be more organized and follow instructions, who may be more motivated to learn than males, and who are more able to attend lectures, in addition to their ability to complete assignments, tasks, and tests.

5. Recommendations

In light of the results, the researchers offers the following recommendations:

- All faculties' members should be encouraged to use the integration between technology and direct teaching that is offered by blended learning.
- Similar studies should be carried out that incorporate the views and experiences of learning practitioners' blended learning into higher education.

6. Delimitations' of Research

- *Subject limits:* The study was limited to the topics of a Physics course that was taught to the students in the academic year 2018/2019.
- *Human limits*: The study was limited to students of the Dentistry College at Ajman University in the United Arab Emirates (UAE).
- *Spatial limits:* Ajman University in the United Arab Emirates.
- *Time limits:* academic year (2018/2019), spring semester.

7. Conclusions

The current study aimed to investigate the effect of the use of blended learning on the achievement of Dentistry College students on a Physics course at Ajman University. The results of this study show that the use of blended learning had a positive effect on the achievement of students of the Dentistry College. There was a statistically significant difference between the experimental and the control groups, in favor of the experimental group, who were taught using the blended learning. Moreover, the findings also revealed that achievement varied according to the gender of the students in the experimental group (in favor of female). This study is important because it shows that blended learning is effective in education, especially in higher education. This means education can be more effective if the advantages of a web environment are blended with face-to-face interaction in courses that contain more visual elements.

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Switching to a Synchronous Mode of Chinese Calligraphy Teaching During the Period of COVID-19 Pandemic: An Experience Report

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The purpose of this report is to describe how a teacher utilized technology to teach elderly learners Chinese calligraphy and how they learnt. Before the incidence of COVID-19, six sessions of Chinese calligraphy were conducted in a community services centre for elderly learners in Hong Kong from 9:00am to 5:00pm on a weekday every week, with each session lasting 75 minutes. There were about 20 learners aged above 50 in each session, and they were naturally grouped in pairs and sat together in a classroom equipped with a data projector. At the very beginning of each session, a teacher of Chinese calligraphy explained the contents of Chinese poems or mottos on the handouts he gave, and he also discussed the Chinese fonts he would use. He then wrote on a piece of paper with illustrative use of Chinese calligraphy brush strokes, alignment, spacing, connectedness, geometry, coherence, etc. After the demonstration, he marked assignments and gave feedback in front of the learners, and subsequently monitored classwork and provided scaffolding assistance. Apart from uploading the video of his demonstration to the YouTube channel which learners could watch, he also employed the augmented reality (AR) technology in a way that learners could choose the word they wanted to watch how to write it rather than going through the entire demonstration sequentially.

During the period of the COVID-19 pandemic, the class was suspended; the teacher kept teaching Chinese calligraphy via a WhatsApp group and YouTube broadcast but the learning outcomes were not very successful. The learners found learning alone difficult, gave few responses and did not submit assignments because they were not socially connected with their classmates in a classroom. The teacher thus switched to a synchronous mode of teaching delivery using Mobile Apps, the learners attended the online class and became motivated because they met each other regularly in order to have social interaction (see Figures 1 and 2). Besides, the learners asked questions and showed their classwork and the teacher could respond promptly. After class, they did assignments and submitted work for evaluation and the teacher gave feedback via WhatsApp. Most learners were satisfied with the synchronous mode of teaching delivery because it enabled more verbal exchanges and social interactions.

Figure 1: Attending an online class in a café

Figure 2: Online class

In the Chinese calligraphy lessons, the teacher taught how to read a word and subsequently form a perceptual image by decoding the visual information encoded on words including the patterns, clusters, gaps, spreads, and variations in brush strokes thus establishing a mental representation. This representation determines which parts of the word position along a common aligned scale on a vertical line or a horizontal line as well as the length, direction, angle, area, and curvature of each brush stroke (e.g., Figures 3 and 4) when reproducing the word on a piece of paper. The teaching pedagogy was grounded on Carpenter and Shah (1998) and Friel et al. (2001).

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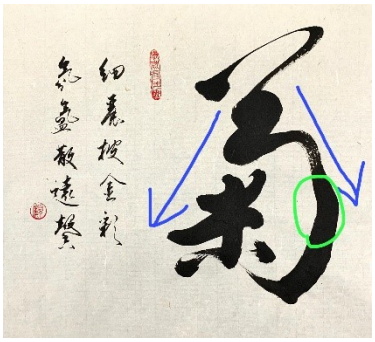

Figure 3: Direction and curvature

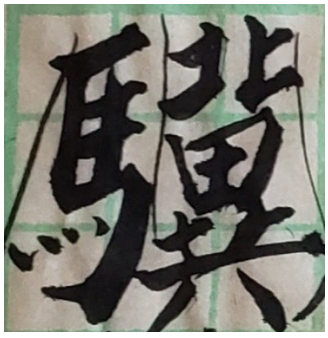

Figure 4: Shape and division of areas

The teaching pedagogy the teacher adopted in this technology-enriched environment took a learner's perspective involving a set of parameters, teacher, learners, and the inclusion of technology. Learners' motivation for learning within a technology-enriched environment would be related to the social context of learning around two major issues, peer interaction and learner-teacher interaction, and that is evident from the online classes.

Concerning the inclusion of technology, the teacher demonstrated concepts with the aid of a data projector, the AR technology, the YouTube broadcast, and WhatsApp. The learners benefited from watching the illustrative demonstration synchronized with his talk and brush strokes. The teacher prepared handouts in both hardcopy and softcopy. Although some elderly learner found it difficult to read a digital screen, especially when decoding the graphical information of a Chinese word, they could study the softcopy anytime and anywhere.

The teacher in this report is a keen Chinese calligrapher and has completed undergraduate education. He showed keen interest, confidence, and competency in integrating technology into classroom teaching and learning. He has positive attitudes, as well as sound interpersonal and relationship skills. His manner with people is warm, pleasant, and caring, and he can build rapport with people. His personal abilities and pedagogical beliefs, as well as subject content knowledge, are of paramount importance because student learning is sensitive to a knowledgeable teacher who prepares lessons to ensure a successful learning process.

The above model of pedagogy of teaching Chinese calligraphy in a technology-enriched environment was successful with the justifications in accordance with research studies in Bozkurt and Ruthven (2017), Drijvers et al. (2010), Geiger (2014), and Jeong and Hmelo-Silver (2016). In addition, the learners gave positive feedback, and expressed sincere thanks for their teacher's devotion to Chinese calligraphy teaching especially in the period of the epidemic of COVID-19. First, they felt better and connected because they were brought together having social interaction and being engaged in the online classes. Second, the teacher fostered a pleasant climate for learning and utilized technology to conduct online classes although some elderly learners encountered technical problems which were solved with their grandchildren's assistance. Third, the teacher was conscientious in organizing learning in the classroom and learners felt confident, competent, and autonomous. Fourth, the teacher was responsive by facilitating discussions, providing timely feedback to learners and motivating them to excel at Chinese calligraphy. Last but not least, learners were appreciative of the teacher's time and passion because the learners needed not to pay any tuition fee.

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Urgent Transition to Group Online Foreign Language Instruction: Problems and Solutions

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Abstract: The purpose of this work is to study how teachers and students react to the urgent large-scale transition to online education. The research was done via surveys conducted at the Center for Additional Educational Programs in the field of Russian as a Foreign Language at St. Petersburg State University. March 2020 transition to distance learning kept intact the lesson schedule, the duration of lessons, and the compliance with the approved programs. This case study was conducted as follows: (1) a questionnaire for teachers was distributed via e-mail; (2) teachers' responses were collected and processed; (3) a questionnaire for students was created in Google Forms; (4) students' responses were collected and processed; (5) the research results were described and analyzed; (6) teachers' and students' responses were compared. The study involved 45 teachers and 100 foreign students, mostly from China. The majority of teachers taught at Level A2 (48%); the majority of students studied at Level B1 (36%). The study shows that modern teachers (77.8%) have a high degree of adaptability, which allows them to switch to new teaching formats in two weeks. They use a variety of teaching aids: not only textbooks mandated by the curriculum (100%), but also other textbooks (91.1%), educational materials from the Internet (88.9%), authentic audio/video materials (51.1%), and self-developed educational materials (53.3%). According to students, the most effective are the authentic materials from the Internet (45%), and the textbook mandated by the program (41%). Both teachers and students noted difficulties in the online training of four language skills: speaking (35.6% of teachers and 32% of students), writing (17.8% and 32%, respectively), listening (15.6% and 40%), and reading (11.1% and 17%). Teachers lack personal communication with students (35.6%), specialized online tools for teaching Russian as a foreign language (13.3%), and effective means of monitoring the acquisition of educational material (31.1%). They strive to solve these problems through a variety of activities, creating an atmosphere conducive to authentic communication. Research data correspond with the conclusions of methodologists about the fundamentally new nature of the relationship between teachers and students in the virtual environment, which is manifested in a less hierarchic teacher-student relationship due to greater initiative, involvement, and independence of students in an online lesson. The article presents a way to study the perception of changes in the teaching mode by teachers and students. The research enriches the e-learning knowledge area with data on how the sudden mass transition to online foreign language learning was carried out.

Keywords: foreign language, teaching methods, online learning, online teaching, COVID-19

1. Introduction

In the spring of 2020, due to the coronavirus pandemic, schools and universities in many countries were forced to switch to the online learning model (learning in a virtual classroom). This educational environment fundamentally differs from the customary one. We will display the contrast using the experience of teaching Russian as a Foreign Language in the Center for Additional Educational Programs at St. Petersburg State University (Russia). The following is an outline of the current situation.

First, the transition to online learning appeared to come as a surprise for teachers. Many of them were not prepared for the transition, as the issue of online learning has traditionally been on the periphery of their pedagogical reality. The teachers who found themselves most well-positioned were those who had had the experience of teaching one-on-one foreign language lessons via Skype, and had either previously used blended learning technologies or had been involved in the creation and support of Massive Open Online Courses (MOOCs). They adapted to the new conditions much faster. Most of the teachers, being full-time education professionals in the classroom environment, had no experience of teaching online. In addition, even teachers with one-on-one online learning experience had difficulty transitioning to teaching groups of foreign language students.

Second, the university executives were not ready for these changes in the educational system. Despite the promotion of distance learning systems and arranging for teachers to be trained to work in these systems, the corresponding infrastructure in higher education was not ready in many countries. This includes Russia, where there were no platforms for distance learning, no previously developed remote educational curriculum for

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academic courses, etc. As a result, in the face of the sudden transition to online learning, most teachers were unable to adapt using the new methodology. During the first few days, most teachers tried to organize lessons by email, and then almost all of them switched to online instruction over video conferencing using Skype and Zoom platforms, mastering their technological capabilities on their own.

Third, the transition to online education turned out to be unexpected for foreign students as well. They did not plan to study remotely and had come to Russia with the express intention of studying Russian, immersed in the environment of the language. These students were forced to modify their plans. For many of them, it proved to be exceedingly difficult to organize themselves and to work in the absence of ongoing teacher supervision. Many students lacked any previous experience of independent study in massive open online courses, and those who had such experience often treated it in a perfunctory manner.

Thus, in the context of the coronavirus pandemic, a new educational setting, that requires both study and reflection, has emerged. The first and the most important step in researching it should be to study those who are involved in the educational process – their psychological state, emerging problems, and possible ways to resolve them.

2. Literature Review

In scholarly literature, it has been repeatedly noted that online learning has an effect on the mind and activities of teachers and students, regardless of its type: blended learning courses, massive courses for independent study, one-on-one learning, virtual classroom using video conferencing, etc. This psychological and pedagogical facet of online education has proved to be one of the most important aspects of academic research in the study of online instruction in various academic subjects, including in the teaching and learning of a foreign language (Bertin, Grave, and Narcy-Combes, 2010; Burns, 2011; Moore and Kearsley, 2005; White, 2003, etc.).

Over the past 20 years, the attention of scholars from around the world has been focused on the psychological characteristics of teachers working online. Researchers have suggested different sets of skills or competencies needed by online teachers, and those, in turn, became the starting point for organizing such teacher training courses.

The first of these works was a book written by C. White (2003), in which the competencies of a distance course tutor are described. The author believes that tutors "will be expected to: adjust their practice to distance language learning environments; counsel learners in their adaptation to distance; identify the characteristics and needs of language learners at a distance; provide ongoing support for learners in new and unfamiliar learning environments; monitor individual learners and the course; respond to a new and different range of issues and affective states in relationships with learners; provide motivating support and tasks at a distance; support students at a distance and help them to become responsible for their learning; work as part of a team with technology experts, learning support staff, etc.; understand the advantages and disadvantages of new language learning environments, and develop appropriate strategies and relevant responses; operate in a context of ongoing change and innovation" (White, 2003, p. 69).

Hampel and Stickler (2005) put forth a hierarchy of new skills/competencies required for tutors in the context of online learning. The authors presented their work in the form of a skills pyramid. Its lowest level is Basic ICT competence, and the following components are built upon it: specific technical competence for the software, dealing with constraints and possibilities of the medium, online socialization, facilitating communicative competence, creativity and choice, and the teacher's own style (Hampel and Stickler, 2005, p. 317). Later, Hampel (2009), relying on this pyramid, developed a program for preparing foreign language teachers to work online.

Turkovskaya (2011) identified 47 professionally significant qualities of a distance learning teacher, including analytical thinking, energy, thoughtfulness, politeness, virtual communication skills, and others. The set of these qualities can also serve as the foundation for training online teachers.

Nikulicheva (2013) developed a profile of necessary qualifications for teachers in the field of distance learning, which included pedagogical and psychological competencies, as well as competencies in the field of information technology. In addition, she described in detail the main problems of a distance learning teacher –

organizational, methodological, communicative, technical, as well as the problems of the teacher's self-development.

Kalinin (2015) identified the difficulties that teachers experience in the distance learning system, among which are the subjective difficulties of beginner PC users, stress that leads to a loss of control over activities, and a lack of confidence, which causes low activity and the desire to avoid situations that can damage self-esteem. He identified the following reasons for these difficulties: a low level of technical aptitude, inability to organize effective interaction with students, inability to adjust from traditional forms of education to new forms, inability to use active teaching methods, conservatism, lack of flexibility, rejection of new pedagogical technologies.

Chelnokova and Tjumaseva (2016) link the skills necessary for a tutor with the main types of the tutor's activities, that is, with creating methodological support, monitoring the digestion of educational material by students, creating an educational environment which corresponds to the conditions of learning, providing technological support, etc.

According to Zankov (2019), the main features of activity of a foreign language teacher in an online environment are flexibility, mobility and client focus, which can be achieved if the teacher combines the professions of a linguist, methodologist, psychologist, manager, marketer, and developer of educational content. The author concludes that the combination of the functions of different professions contributes to the improvement of the teacher's competence and ensures systematization, flexibility, competitiveness, and efficiency of work in an online environment.

There is a notable series of papers that present the results of empirical research related to the professional skills of an online teacher. For example, a remarkable study is described by Ernest, Heiser and Murphy (2013), employees of the Department of Languages at The Open University (UK) and the Universitat Oberta de Catalunya (Spain). For teachers of a foreign language to be aware of the peculiarities of working in a virtual environment, they were offered the opportunity to take a joint online foreign language course. The results of this project were studied using an open-closed questionnaire and interviews.

Comas-Quinn, de Los Arcos and Mardomingo (2012), having analyzed the relationship between teachers and students in a virtual environment, concluded that online learning could only be successful if students were motivated and displayed active engagement and independence. This inevitably leads to a change in the traditional hierarchy and relationship between teachers and students. The authors state that these relationships are always in a state of flux as new hierarchies and relationships are constantly being formed.

The psychological characteristics of students are also considered by Arispe and Blake (2012). The authors found that student conscientiousness provides the best results in blended learning. In addition, they determined that students with a low level of foreign language proficiency are most interested in working with online materials, as this allows them to work on the Internet at their own pace.

According to the study by West (2011), attributes of students such as independence, learning performance, interaction with other learners, and satisfaction affect the success of distance learning.

From the point of view of the organization of the educational process, online learning requires new forms, models, and styles of teaching. This is because the roles of the teacher and the student change and the educational landscape changes completely, due to sophisticated communication technologies. "Traditional teacher-centred pedagogy has proven to be outdated and a constraint to the online learner. Online teachers must adopt new approaches with learners at heart" (Sun, 2011). Researchers agree that a radical shift of pedagogy towards an individualized, small group orientated, multi-dimensional model of teaching is necessary, as well as individually oriented teaching; the importance of acquiring indispensable technical and pedagogical skills is constantly emphasized (Paepe, Zhu, and Depryck, 2018). There are also methods proposed specifically for new educational design, for example, "The flipped classroom" (Tsytovich, Boronenko, and Yakusheva, 2019, etc.), but there are very few of them.

Thus, the psychological characteristics of participants in online learning are reflected quite fully and diversely in scholarly literature, and the methods of questionnaires and interviews are often used as a means of obtaining data. However, there are no studies that investigate the situation of an abrupt massive transition of teachers

and students to online learning. Such a study would focus on teachers who previously had not specifically engaged in online learning, were not familiar with its relevant methodological literature and, as such, experienced a number of psychological, pedagogical, and technical difficulties. It would also examine the students who did not have any online learning experience.

It is the transition to online learning that this study is focused on.

3. Methodology

3.1 Objective and method

The purpose of this work is to explore the reception of an abrupt massive transition to online learning by the participants in this process – teachers and students. The most important aspect of the study was to identify the difficulties they experienced in this new educational environment and ways in which to overcome these difficulties. The research was done through surveys.

3.2 Context

The study was conducted at the Center for Additional Educational Programs in the field of "Russian as a Foreign Language" at St. Petersburg State University (Russia), which provides training for foreign students at six levels of Russian language proficiency, with each group consisting of 15 students. In total, 900 students studied at the Center at the time of the transition to the distance learning model.

Teachers were advised to use various online resources in teaching; for this, classrooms were equipped with interactive boards connected to the Internet. Nevertheless, offline education remained the main form of language study for foreign students at the Center for Additional Education in Russian as a Foreign Language. A small portion of teachers were able to successfully use online resources (e.g. Malyshev and Glazunova. *Succes+A1*), working on systems that can be characterized as variants of computer-assisted teaching/learning and blended teaching/learning.

In March 2020, with the 100% transition of the indicated education system to the distance format (classes from March 30th onward were conducted via the Zoom platform), all the requirements for the organization of the learning process remained: the lesson schedule (20 hours of lessons of Russian as a foreign language for each group per week), along with the duration of the lesson (90 minutes), and compliance with the approved programs (changes in curriculum due to a change in the form of study wasn't allowed), remained in effect.

3.3 Participants

Forty-five teachers (out of 100 teachers working in the program) and 100 students (out of 900 students) answered the questionnaire. The varying degree of activity in the survey of teachers and students is explained by the fact that students have recently begun to learn Russian (most of them speak Russian at the A2 level) and, possibly, by ethno-cultural and age characteristics of students (most of the students are graduates of Chinese schools who are going to study at university). All of the teachers were certified to teach Russian as a foreign language, some of them had certificates confirming their competence in the field of E-Learning. Teaching experience ranged from 0 to 40 years.

Foreign students taking Russian language courses at St. Petersburg State University come from all continents, but mainly from Asia. Most of these students are Chinese citizens. All of them have e-learning tools and modern computer programs, but many have only smartphones and do not have computers or laptops, which makes online learning difficult. Many students are planning to reach the B1 level, obtain a B1 level certificate, and then enroll in various Russian universities. An important aspect of these students is their motivation: the desire to take full-time Russian language training immersed in a language learning environment.

3.4 Instruments

An open-closed-format questionnaire was prepared for the survey of teachers, which allowed for a maximum range of answers. Despite certain difficulties associated with their processing, these answers, in general, provide the most complete picture of the teacher's reception to the massive transition to online learning.

Table 1: Questionnaire for teachers and its features

Questions	Category/keyword	Scale	Answer type
How quickly did you develop an online learning model?	Adaptation time	- immediately - 1-2 weeks - did not develop - other	Choice of one answer from those proposed or an Open-ended response
What materials do you use during the online lesson? (Please select one or more answer options).	Educational tools	- textbook, mandated by the curriculum; - other textbooks; - educational materials from the Internet; - authentic audio and video materials; - self-developed materials	Choice of one, or more than one answer, from those proposed
What types of assignments turned out to be ineffective during an online lesson and did you have to give them up?	Ineffective study assignments		Open-ended response
What do you lack when teaching Russian in an online classroom?	Lack of resources		Open-ended response
How are you trying to compensate for this lack?	Compensating for lack of resources		Open-ended response
The level of the group which you are teaching?	Language proficiency	A1 A2 B1 B2 C1 C2	Choice from the proposed, several answers are possible

For the survey of students, a closed-format questionnaire was prepared, containing questions with pre-offered answers (multiple choice).

Table 2: Questionnaire for students and its features

Questions	Category/keyword	Scale	Answer type
How quickly did you get used to learning remotely?	Time of adaptation	- I have a lot of experience in online learning, so I did not have any difficulties and I didn't need any time to adjust. - It took me 1-2 weeks - I am still not used to online lessons.	Choose one answer
How difficult is it to communicate with the teacher during an online lesson?	Student-teacher communication	From 1 (minimum) to 5 (maximum)	Scale
How difficult is it to communicate with your classmates during an online lesson?	Student-student communication	From 1 (minimum) to 5 (maximum)	Scale
How difficult is it to understand the teacher and your classmates during an online lesson?	Reception of words of other participants	From 1 (minimum) to 5 (maximum)	Scale
How difficult is it to work in pairs during an online lesson?	Working in pairs	From 1 (minimum) to 5 (maximum)	Scale
How difficult is it to read texts on the screen during an online lesson?	Text reception on the screen	From 1 (minimum) to 5 (maximum)	Scale
How difficult is it to complete writing	Writing assignments	From 1 (minimum) to 5 (maximum)	Scale

assignments during an online lesson?			
Does the teacher's lack of response to your answers interfere?	Teacher response	From 1 (minimum) to 5 (maximum)	Scale
What helped you focus on your online lesson?	Means of retaining attention	- I liked it when the teacher gave small written assignments, which we immediately checked - It helped me when the teacher joked around - It helped me that the teacher gave a lot of homework and it was easier for me to understand the lesson later - The teacher's presentations helped me a lot - I liked that the teacher asked questions throughout the lesson, this kept me from getting distracted - I was helped by pictures, photos, and videos that the teacher used	Choice of three from the proposed options
What materials do you find most effective for working in an online classroom?	Effective material	- basic textbook, as it would be in the classroom - relevant materials from the Internet - materials prepared by the teacher for your group	Choice of 1 answer
To what extent do you lack online materials for learning Russian as a Foreign Language?	Online learning products	From 1 (minimum) to 5 (maximum)	Scale
How severely does your computer lacking the technical capabilities necessary for an online lesson?	Computer components	From 1 (minimum) to 5 (maximum)	Scale
How much do you miss the usual forms of learning in an online lesson (board work, working in pairs, game tasks)?	Forms of education	From 1 (minimum) to 5 (maximum)	Scale
How much emotional drive do you lack in the online lesson?	Emotional component of the lesson	From 1 (minimum) to 5 (maximum)	Scale
How much self-discipline do you lack in an online lesson?	Discipline, organization	From 1 (minimum) to 5 (maximum)	Scale
What level group do you study in?	Language proficiency	A1 A2 B1 B2 C1	Choice of 1 answer from the answers

Most of the questions in the questionnaire for students are designed to find out the students' opinions about the techniques and methods of working online that were used by the teachers, and therefore it is possible to compare the attitude of the teacher and students towards the same objects and tools.

3.5 Procedure

The order of the researchers' actions was as follows: the compilation of a questionnaire for teachers, followed by its distribution to teachers via e-mail, and the collection and processing of their responses. Then came the compilation of questionnaires for students, conducting a survey of students using Google Forms, and the processing of their answers. This was proceeded by describing and analyzing the research results, as well as comparing the answers of teachers and students.

3.6 Results

3.6.1 The presentation of the results of the survey of teachers (see Appendix A)

Answering the first question "How quickly did you develop an online learning model?", 77.8% of respondents indicated that it took them 1-2 weeks to adapt to online learning, 13.3% had previously mastered online methodology, 6.7% have not yet found the optimal model, and 2.2% did not give an answer. Accordingly, for most of the teachers, though the transition to online learning was unexpected, 77.8% adapted to the new conditions within two weeks.

In response to the second question "What materials do you use during the online lesson?", 100% of teachers answered that they used the textbook mandated by the curriculum, 91.1% used other textbooks, 88.9% used study materials from the Internet, 51.1% – authentic audio and video materials, 53.3% used their own materials, which were specially designed for specific classes. Thus, teachers use a variety of teaching aids.

For the third question, "What types of assignments turned out to be ineffective during the online lesson and did you have to give them up?", 8.9% of respondents did not give up anything, but used traditional tasks while taking into account the specifics of remote work. 35.6% of respondents noted that they had difficulties with training of speaking, 15.6% – of listening, 11.1% – of reading, 18.8% – of writing, 8.9% – of vocabulary, grammar and pronunciation. 17.8% – with classroom management. 15.6% of respondents did not answer this question at all. As can be seen, teachers do not abandon traditional types of work but note the difficulties in using them when working in an online format. The main problems are associated with teaching speaking and writing, as well as with the organization of monitoring the learning results.

Answers to the fourth question "What do you lack when teaching Russian in an online classroom?" were also diverse: 35.6% noted the lack of normal, high-quality communication with students, of classroom dynamics, and of emotional connection, and 6.7% lacked communication with colleagues; 24.4% of respondents noted a lack of student discipline and motivation, 31.1% indicated the impossibility of monitoring the work of the entire study group, and 13.3% noted a lack of Internet resources for teaching Russian to foreigners (interactive tasks, developments for specific topics, and electronic textbooks); 20% noted the absence of technical skills, 17.8% noted technical problems either among themselves or students. Thus, in answering the fourth question, teachers largely repeated what they had already written down in answers to the third question: they lack full-fledged communication with students, are not satisfied with the attitude of students towards their studies, and they note the presence of technical problems and the state of online resources.

Answering question 5 "How are you trying to compensate for this?", the teachers gave the following answers: 20% use different types of oral, written, and group assignments, 15.6% – personal qualities (humour, communication outside the classroom in chats), 8.9% focus on homework, 6.6% make up for the lack of educational materials with a variety of materials from the Internet and their own materials, 4.4% believe that the success of online learning is increased by creative tasks, as well as elements of competition, 11.1% consider greater involvement of students necessary in the learning process (i.e., an increase in the number of tasks to complete both in the classroom and at home), 11.1% use a variety of visual aids, 4.4% use e-mail and WhatsApp in addition to the Zoom program. At the same time, 17.8% of respondents generally declined to answer. Thus, teachers, on the one hand, diversify the types of tasks, expand channels of communication with students, and increase the volume of tasks, including those for independent work. On the other hand, they strive to make the learning process more interesting by attracting authentic materials from the Internet, using creative tasks, as well as elements of humour.

The last question, number 6, was about the level of the study group: 13.3% of teachers worked with A1 level groups, 46.7% with A2 level groups, 28.9% with B1 level groups, and 11.1% with B2 level groups.

3.6.2 The presentation of the results of the survey of students (see Appendix B)

Answering the first question, 44% of students indicated that it took them 1-2 weeks to get used to distance learning; 41% of students did not need any time to get used to it; 15% of students, two months after the start of classes, were still not used to online lessons. It seems that for the students, the sudden change in the form of teaching did not create the same level of difficulty as it did for the teachers.

Evaluating on a scale from 1 to 5 how difficult it is to communicate with a teacher during an online lesson, 38% of students chose the average indicator, 25% did not experience any difficulties, 22% experienced minor difficulties, 8% believed that there were difficulties, and 7% believed that there were great difficulties. Apparently, for students, online communication is a more familiar form of communication than for teachers.

This idea is also confirmed by answers to the third question, which was in regards to communication with other students in the group: 31% do not see any difficulties, 21% note minor difficulties, 19% sometimes have problems, 19% agree that there are difficulties, 10% indicate significant difficulties.

The fourth question was about understanding the words of the teacher and of the other students during the online lesson: 40% chose the middle position of the scale, 22% – the minimum, 20%, apparently, sometimes had problems in this area, 12% believed that it was difficult to understand others, 6% answered that it was very difficult to understand others during an online lesson. In the authors' opinion, similar answers would also have been received after an offline lesson, since the level of understanding of what was heard would likely be influenced by the degree of concentration of the student and his or her level of language proficiency, rather than the form of the lesson.

The following scale shows how students think about the opportunity to work in pairs during an online lesson: 32% chose the average answer, 26% did not notice difficulties, 20% believed that there were a few of them, 13% agreed that there were difficulties, and 9% believed that there were significant difficulties. Evidently, organizing working in pairs in online learning is generally not difficult for students.

A predictably small number of students find it difficult to read texts on the screen (4% – very difficult and 13% – difficult); 35% have no difficulty, 26% have no difficulty in general, and 22% have almost no difficulty. Most students are more accustomed to working with a screen than working with paper materials.

Completion of written assignments during an online lesson also does not cause difficulties for the majority of students: 32% of participants chose the middle position of the scale, 26% answered "unlikely", 24% – "no", and only 18% have difficulties in completing them (11% – great difficulties, 7% – difficulties).

Less predictable was the answer to the question of whether students are disturbed by the fact that they do not always see the teacher's reaction to their verbal activity. Oddly enough, this bothers only a small percentage of students (26% chose the minimum position, 25% – "2", 32% – "3", 12% – "4" and 5% – "5").

Question 9 implied the ability to choose 3 answer options, and therefore the sum of the answers is more than 100%. Thus, 63% of students were helped by pictures, photos, and videos that the teacher used; 48% chose "I liked it when the teacher gave small written assignments in the lesson, which we immediately checked", 48% chose "it helped that the teacher gave a lot of homework and it was easier for me to understand the lesson later" and 48% chose "I liked that the teacher during the lesson asked a lot of questions, it did not allow me to get distracted"; 40% chose the option "it helped when the teacher joked", 29% – "the teacher's presentation helped". Obviously, the traditional methods of attracting and holding attention during the lesson (visual presentation of the material) remained the most beneficial for students.

Answering question 10, 41% of respondents indicated that the most effective material for an online lesson remained, as it would be in a classroom setting, a basic textbook. For 45%, the most effective materials were relevant materials from the Internet, for 14% – materials that the teacher prepared for the group.

Answering question 11, regarding the lack of online products for teaching Russian as a Foreign Language, 37% chose the middle position, 27% had no problems, 22% had almost no problems, 6% admitted the existence of a problem, and only 8% of students believed that this was a serious problem.

Teachers and university heads worry about the problem of students' technical capabilities, but the students themselves in the survey are more likely to be satisfied with the capabilities of their computers: 28% have no problems, 29% have almost no problems, 29% sometimes have problems, 5% have problems, 9% have significant problems.

Students generally do not strongly miss the usual forms of learning: on a scale from a minimum of 1 to a maximum of 5, the answers are arranged as follows: 19 – 24 – 39 – 8 – 10.

Moreover, factors that the teachers worried about, such as the lack of personal communication or the absence of the opportunity to receive emotional stimulation, did not seem to worry the students. The results, on a scale from 1 to 5, were as follows: 18 – 30 – 27 – 17 – 8.

While answering question 15 "How much do you lack self-discipline in online lessons?", 36% respondents chose "there are some problems", 21% – "almost no problems", 20% – "no problems", 12% – "yes, there is a problem", 11% – "a big problem".

Among the responding students, 36% studied in the B1 level group, 23% – B2, 19% – A2, 19% – A1, 3% – C1.

4. Data analysis and discussion

The comparison of the results from the survey of the teachers and that of the students, with commentary.

Table 3: Category "adaptation time"

Teachers	**Students**
How quickly did you develop a model for conducting an online lesson? ● 77.8% – 1-2 weeks ● 13.3% – had the skills for conducting an online lesson ● 6.7% – did not find the optimal model ● 2.2% – no answer	How quickly did you get used to learning remotely? ● 1-2 weeks – 44% ● I already had experience – 41% ● I am not used to it – 15%

Table 3 shows that, despite the abruptness of the introduction to distance learning, along with the general psychological and methodological unpreparedness for this format of teaching, only 13.3% of teachers note that they have long mastered the methodology of conducting an online lesson, while 77.8% of teachers were able to adapt to this new form in 1-2 weeks and developed an optimal model for an online lesson. This was facilitated by the fact that 41% of the students had prior distance learning experience. Only 15% of students note that they are not used to the distance format; 6.7% of teachers believe that they have not yet found the optimal model. This means that modern teachers have a high degree of adaptability, which allows them to quickly adapt to new teaching challenges.

Table 4: Category "teaching aids"

Teachers	**Students**
What materials do you use during the online lesson? - textbook mandated by the curriculum – 100%; - other textbooks – 91%; - educational materials from the Internet – 88.9%, - authentic audio and video materials – 51.1%; - self-developed materials – 53.3%.	What materials do you find most effective for working in an online classroom? - Materials prepared for the group by the teacher –14% - Basic textbook, as it would be in the classroom – 41% - Authentic/relevant materials from the Internet – 45%

Table 4 shows that 100% of teachers use the textbooks mandated by the curriculum in teaching, which is largely explained by the requirement to work according to the approved programs and use the mandated textbooks. However, in the context of online learning, reliance on these textbooks is not enough, so teachers use other materials available to them. Only 53.3% of teachers develop their own materials specifically for their study group, which, can be explained, either by their inability to create such materials, or by the lack of time to develop them. It should be borne in mind that from the point of view of 14% of students, these materials are most effective for working in an online classroom. At the same time, the results of the survey showed that students also preferred to work with a basic textbook (41%) and with up-to-date materials from the Internet (45%).

The requirement by the university to work in the online learning environment, according to the approved programs, and to use the mandated textbooks, can be considered a factor that restrains the initiative of teachers and their desire to experiment, which are necessary in the search for new teaching methods and techniques. Teachers working in a new educational environment need to be given more freedom in choosing the content, methods, and means of teaching.

Table 5: Category "ineffective learning assignments"

Teachers	Students
What types of assignments appeared to be ineffective during the online lesson and did you have to give them up?	How difficult is it to communicate with a teacher during an online lesson? 38% (there are some problems); 25% (not difficult); 22% (not very difficult); 8% (difficult); 7% (very difficult)
35.6% – difficulties in the online training of speaking	How difficult is it to communicate with your groupmates during an online lesson? 31% – not difficult, 21% – not very difficult, 19% – there are some problems, 19% – difficult, 10% – very difficult How difficult is it to work in pairs during an online lesson? 32% – there are some problems, 26% – not difficult, 20% –almost not difficult, 13% – difficult, 9% – very difficult
17.8% – difficult to control	Does the teacher's lack of response to your answers interfere? 32% – there are some problems, 26% – does not interfere, 25% – hardly interferes, 12% – interferes, 5% – interferes very much
17.8% – difficulties in the online training of writing	How difficult is it to complete writing assignments during an online lesson? 32% – there are some problems, 26% – not very difficult, 24% – not difficult, 11% – very difficult, 7% – difficult
15.6% – difficulties in the online training of listening	How difficult is it during the online lesson to understand the words of the teacher and groupmates? 40% – there are some problems, 22% – not difficult, 20% – not very difficult, 12% – difficult, 6% – very difficult
11.1% – difficulties in the online training of reading	How difficult is it to read texts on the screen during an online lesson? 35% – not difficult, 26% – there are some problems, 22% – not very difficult, 13% – difficult, 4% – very difficult

The data in Table 5 show that both teachers and students note difficulties in the online training of speaking (35.6% of teachers and 32% of students), writing (17.8% and 32%, respectively), listening (15.6% and 40%), and reading (11.1% and 17%). These difficulties are objective. Language skills development requires not only the orientation of students in learned speech actions, but their intensive training in authentic situations. Even in traditional teaching, this training has a bit of an artificial character. In online learning, the level of its artificiality increases exponentially.

Table 6: Category "lack of resources"

Teachers	Students
Online products – 13.3%	Is there a lack of online materials for learning Russian as a Foreign Language? 37% – there are some problems, 27% – no problems, 22% – almost no problems, 8% – a big problem, 6% – yes, there is a problem
Lack of communication (real full-fledged face-to-face communication with students) – 35.6% Communication with colleagues – 6.7%	Do you lack emotional drive in online lessons? 30% – almost no problems, 27% – there are some problems, 18% – no problems, 17% – yes, there is a problem, 8% – a big problem
Lack of physical items (board, classroom space, library, books) – 6.7%	How much do you lack the usual forms of learning in an online lesson (board work, working in pairs, game tasks)? 39% – there are some problems, 24% – almost no problems, 19% – no problems, 10% – a big problem, 8% – yes, there is a problem
Lack of control over students – 31.1% Lack of discipline and motivation of students – 24.4%	How much do you lack self-discipline in online lessons? 36% – there are some problems, 21% – almost no problems, 20% – no problems, 12% – yes, there is a problem, 11% – a big problem
Technical problems – 17.8% Lack of technical skills – 20%	To what extent does your computer lack the technical capabilities for an online lesson? 29% – almost no problem, 29% – there are some problems, 28% – no problem, 9% – a big problem, 5% – yes, there is a problem

Table 6 shows that teachers lack personal communication with students (35.6%), and the result of this lack may be both psychological discomfort and an inability to organize lessons appropriately. Other positions, which the teachers took in their answers, were also predictable: special online materials that make the teacher's work

more manageable (13.3% would like to see more of them), physical objects are the usual material for explanation in the classroom (6.7% say they are irreplaceable), organizing control in an online class is a unique endeavour (31.1% understand that they do not yet have the skills to perform it).

The answers of the students show that they generally agree with the indicated problems, but do not find them particularly serious (to all questions of this group, the majority of answers are close to the middle ("there are some problems").

Table 7: Category "compensating for lack of resources"

Teachers	**Students**
How are you trying to compensate for this lack?	What helps you focus on your online lesson?
Creativity, humour, communication outside the classroom in chats – 15.6%	The teacher's jokes – 40%
Different types of oral, written, group assignments – 20%	Small written assignments that were immediately checked – 48%
Asked more questions – 11.1%	Questions during the lesson – 48%
Focus on homework – 8.9%	A lot of homework – 48%
Visuals – 11.1%	Pictures, photos, videos.... – 63%
Additional technical means – 4.4%	
Additionally prepared materials – 11.1%	The teacher's presentations – 29%

Table 7 shows that not all teachers found a way to compensate for the lack of resources, which in answer to another question, they had considered a problem. However, most often, teachers try to diversify the types of teaching assignments (20%) and use humour and jokes (15.6%). Students, on the other hand, quite unanimously believe that the use of pictures, photographs and other visual materials is the most effective (63%), and not all the students are motivated to work actively in the lesson by the teacher's jokes (40%).

5. Conclusions

As a result of the survey of teachers and students, the peculiarities of their perceptions of the new educational environment, along with ways of adapting to this environment, were identified. The analysis of the research results allowed for the following conclusions to be made.

1. The adaptation of the majority of teachers and students to the new educational environment took 1-2 weeks. Modern teachers of a foreign language have a high degree of adaptability, which allowed them to adapt to a new teaching format in a short amount of time.
2. All teachers, in the context of an emergency transition to online education, work according to the textbook, which is mandated by the curriculum and was used in traditional classroom teaching. At the same time, almost all teachers are aware of its insufficiencies and use other teaching materials. With that said, about half of the teachers do not use their own materials for online instruction, which might be due to either their inability to create them, or to the lack of time to prepare for classes in this new environment. It is absolutely necessary to train teachers on how to create these materials, since, according to the results of a questionnaire of students, educational materials specially developed for online lessons are the most engaging.
3. The desire of teachers to preserve the features of traditional education in an online setting can be largely explained by the requirement to work according to approved programs and to use mandated textbooks. However, this can be viewed as a factor that holds back their initiative and desire to experiment. Teachers working in an online learning environment need to be given more freedom in the choice of content, methods, and means of teaching.
4. Teachers are aware of the ineffectiveness of many traditional teaching methods, as well as the impossibility of classroom management in online learning. The main difficulties they highlight are the lack of full-fledged communication with students and a loss of control. The limited interaction with other students and the teacher is also noted by students as a disadvantage of online learning.
5. All teachers have difficulties in training of four language skills, in teaching vocabulary, grammar and pronunciation, as well as classroom management. They try to solve emerging problems through a variety of tasks and by creating an atmosphere conducive to communication. This correlates with the conclusions of methodologists about a fundamentally new nature in the relationship between teachers and students in a virtual environment, which is manifested by the change in the hierarchy of "teacher-

student" relations due to greater initiative, involvement, and independence of students in online learning.

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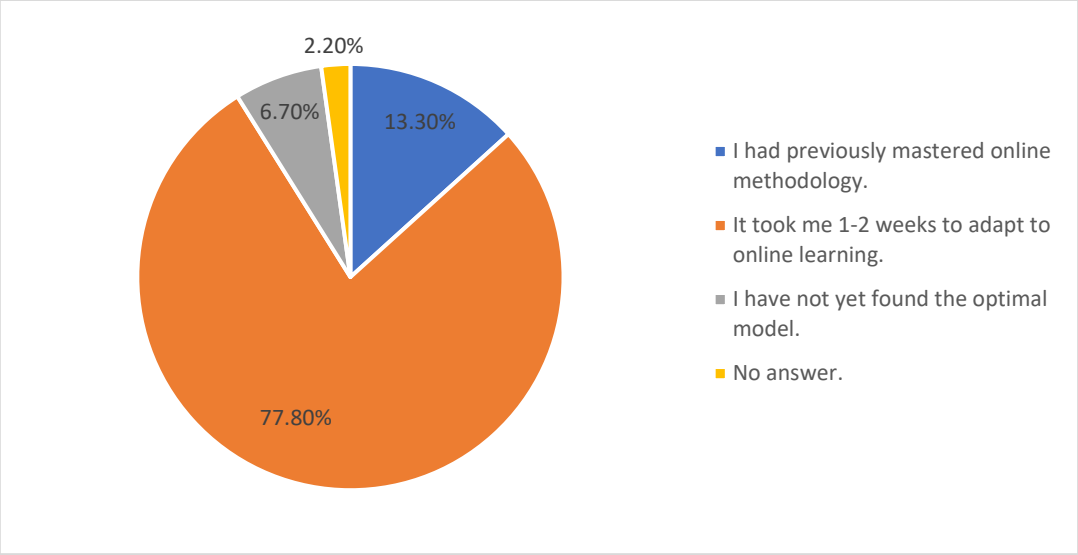
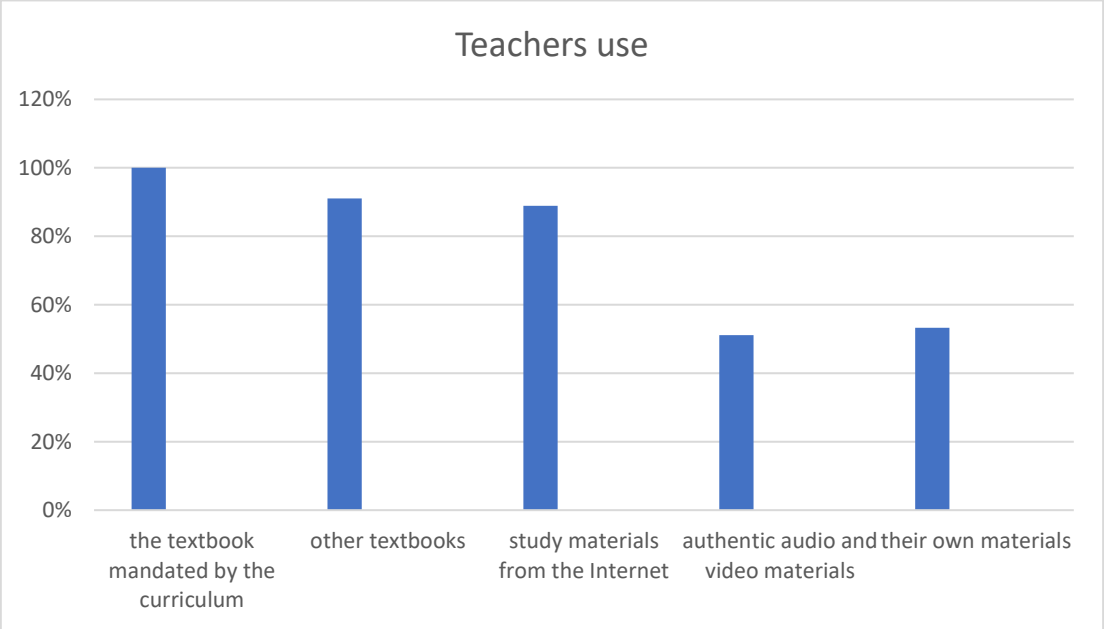
Appendices

Appendix A: Results of the survey of teachers.

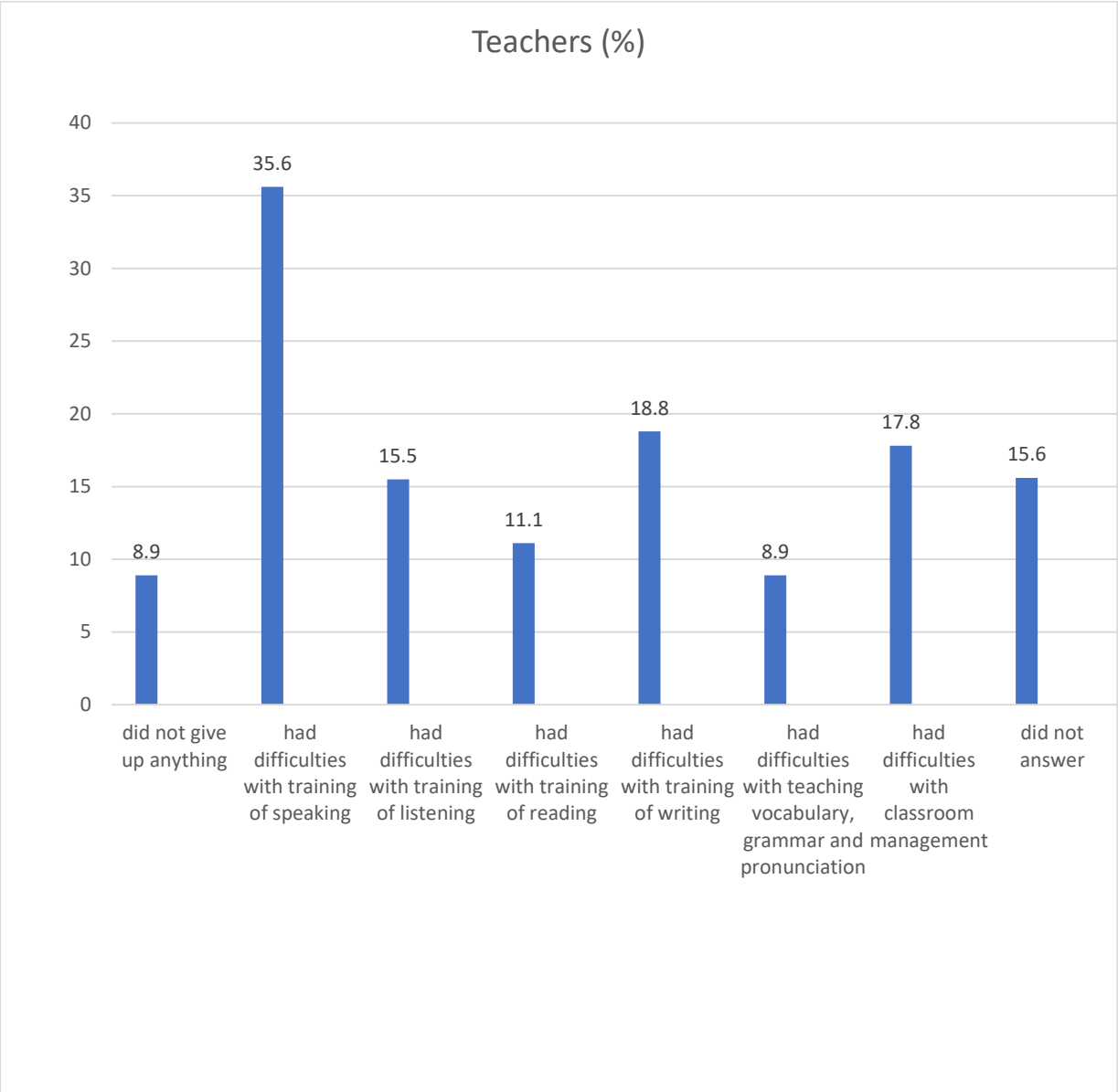
Question 1: How quickly did you develop an online learning model?



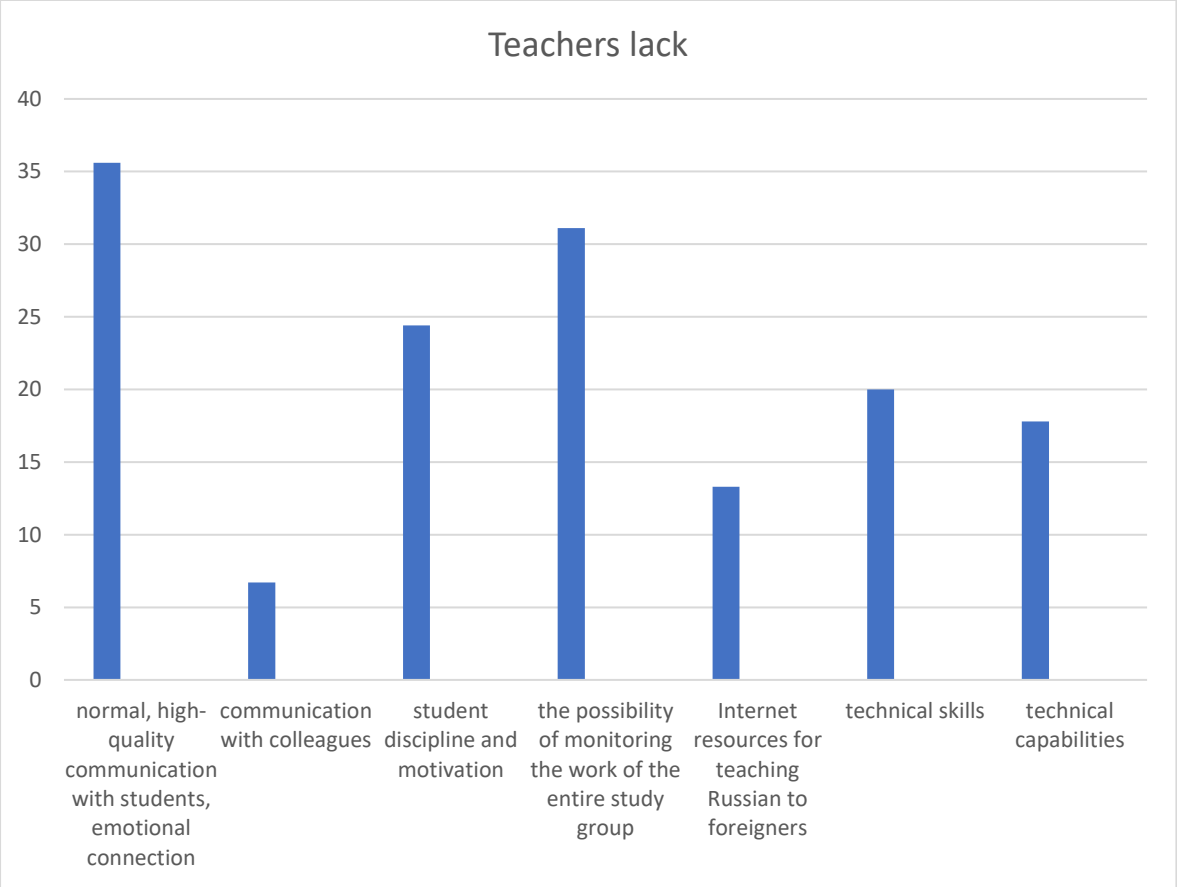
Question 2: What materials do you use during the online lesson?



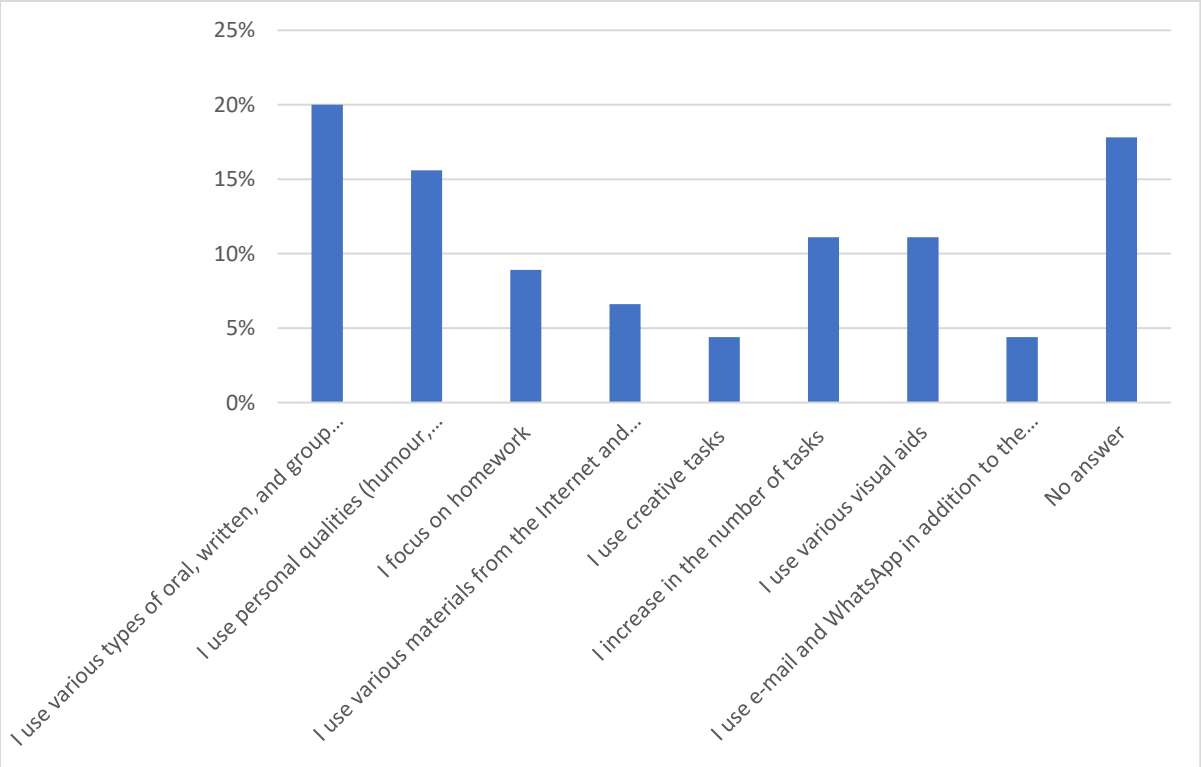
Question 3: What types of assignment turned out to be ineffective during the online lesson and you had to give up?



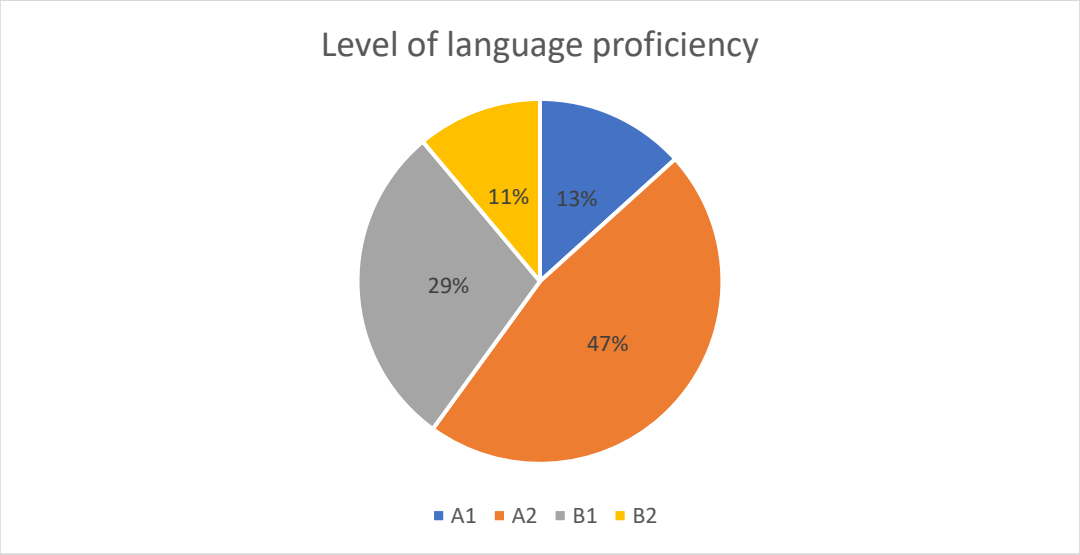
Question 4:What do you lack when teaching Russian in an online classroom?



Question 5: How are you trying to compensate for this?



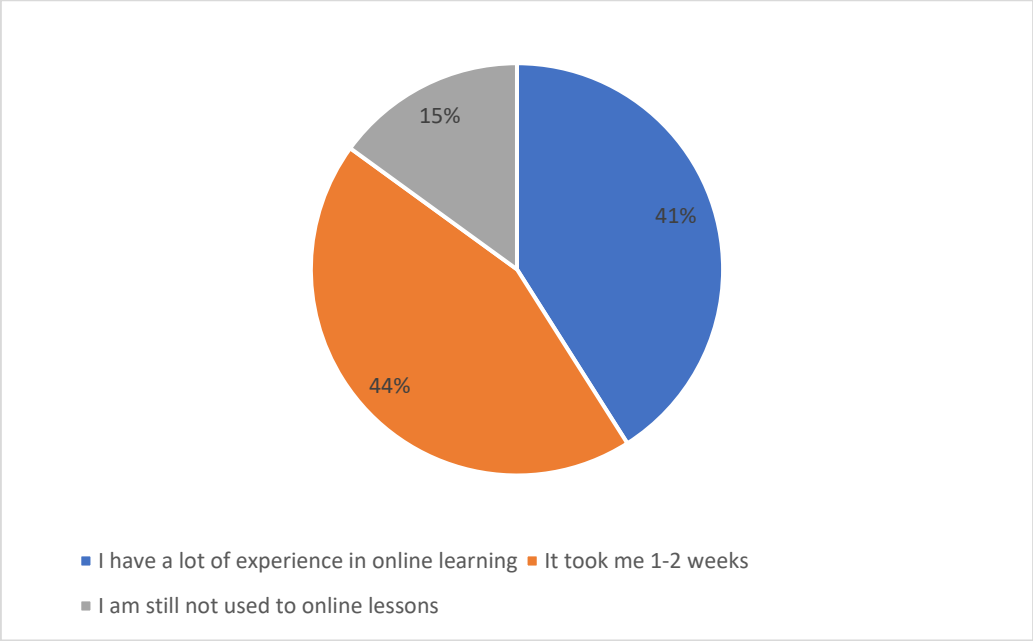
Question 6: The level of the group you are teaching.



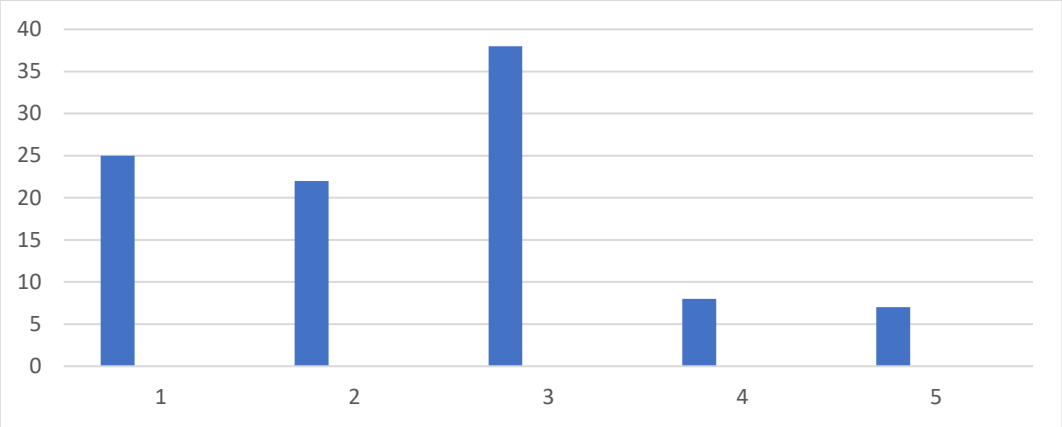
Appendix B: Results of the survey of students

https://docs.google.com/forms/d/1ZfsJKd5EKuxLR9g7RguJ01IwNJsaJpNLk09o5M-oGDE/edit#responses

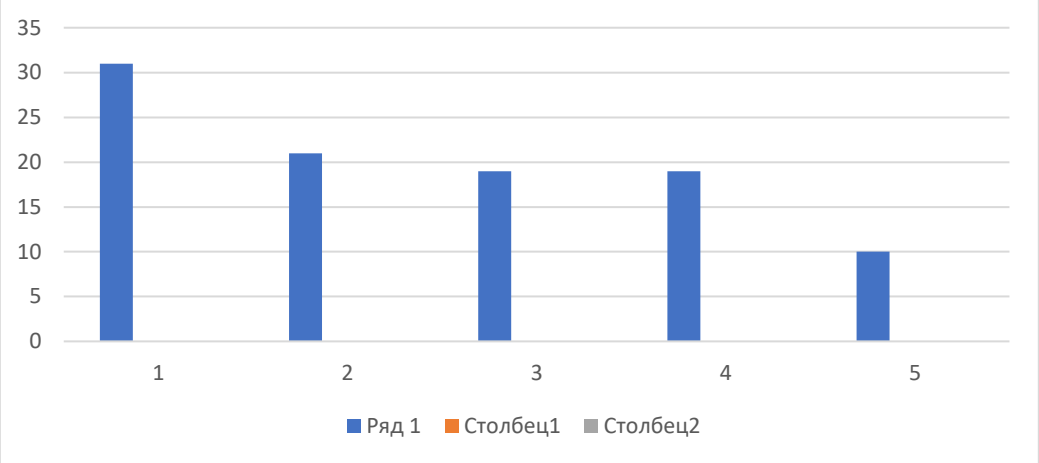
Question 1: How quickly did you get used to learning remotely?



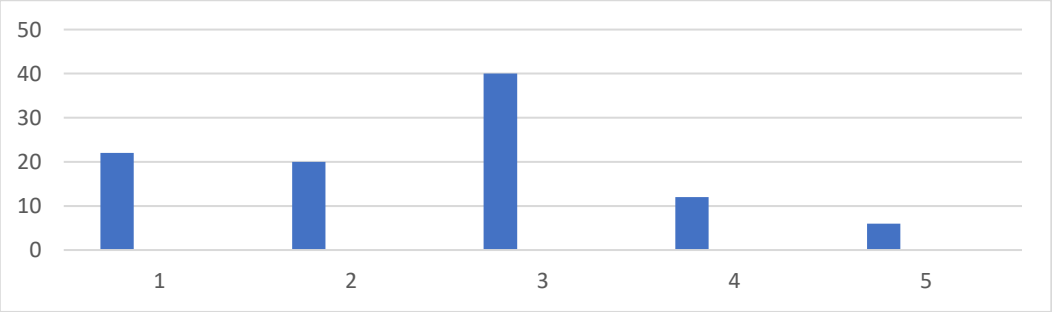
Question 2: How difficult is it to communicate with the teacher during an online lesson?



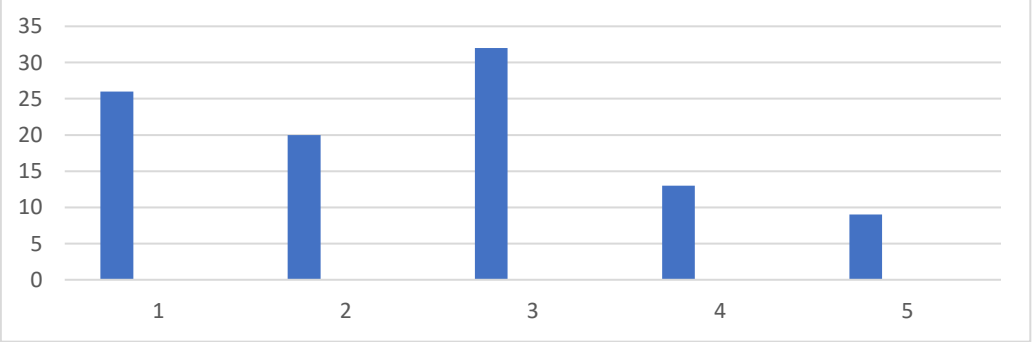
Question 3: How difficult is it to communicate with your classmates during an online lesson?



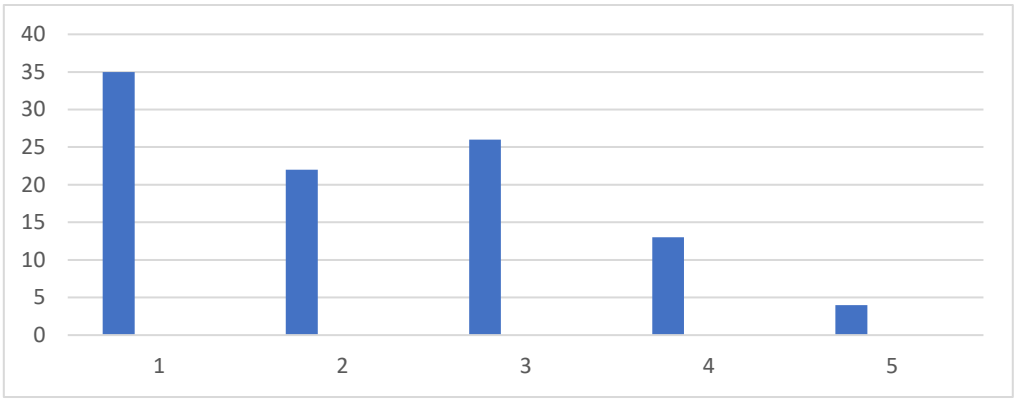
Question 4: How difficult is it to understand the teacher and your classmates during an online lesson?



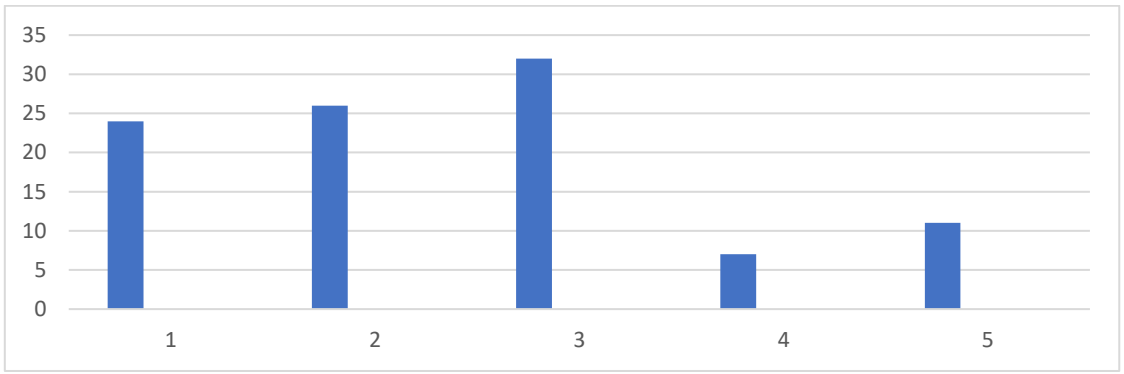
Question 5: How difficult is it to work in pairs during an online lesson?



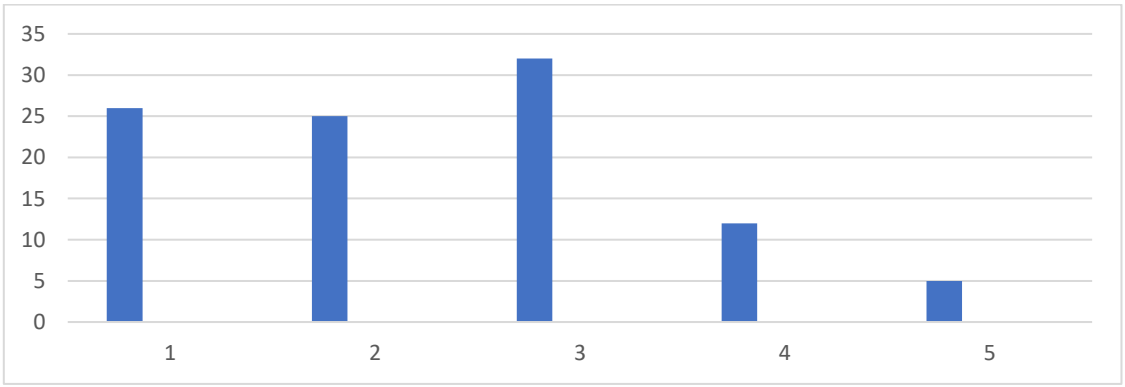
Question 6: How difficult is it to read texts on the screen during an online lesson?



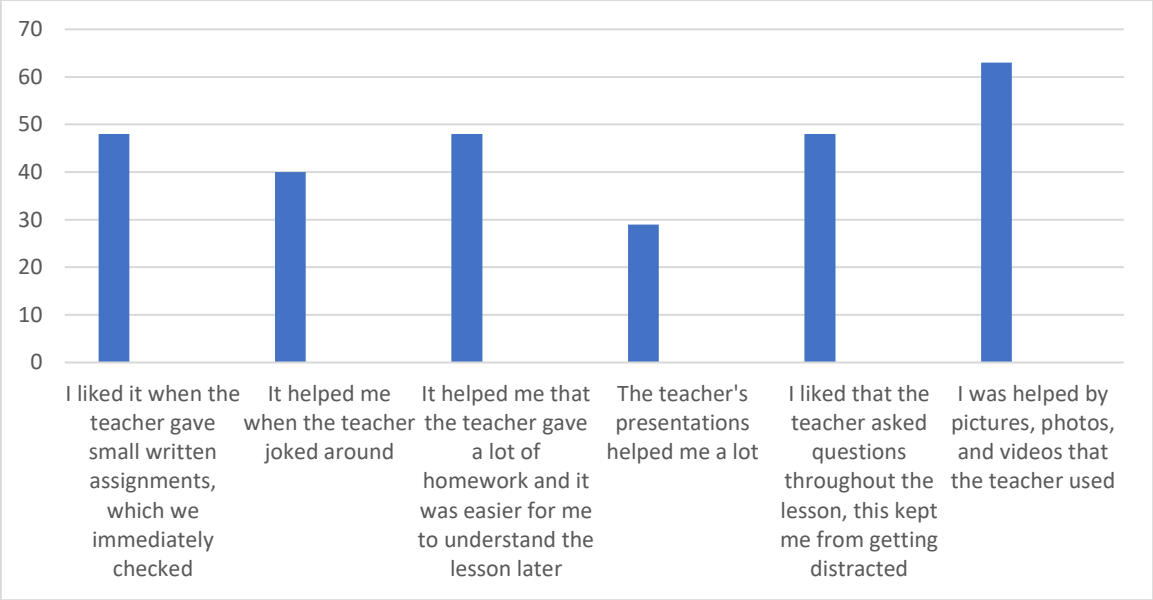
Question 7: How difficult is it to complete writing assignments during an online lesson?



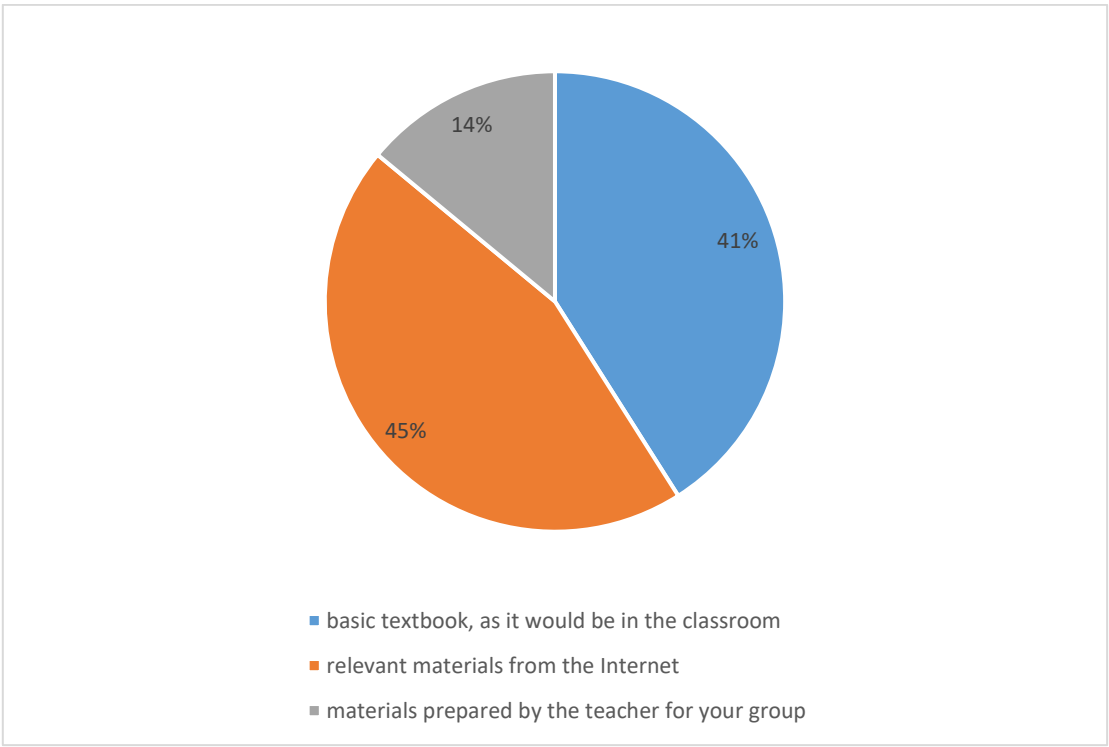
Question 8: Does the lack of teacher's response to your answers interfere?



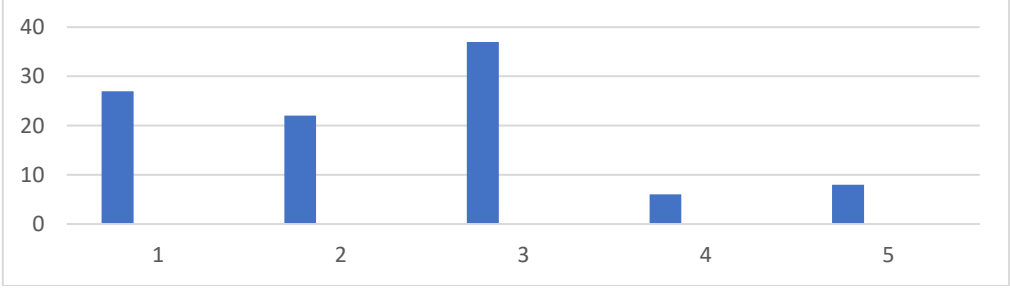
Question 9: What helped you focus on your online lesson? (Pick 3 most important options)



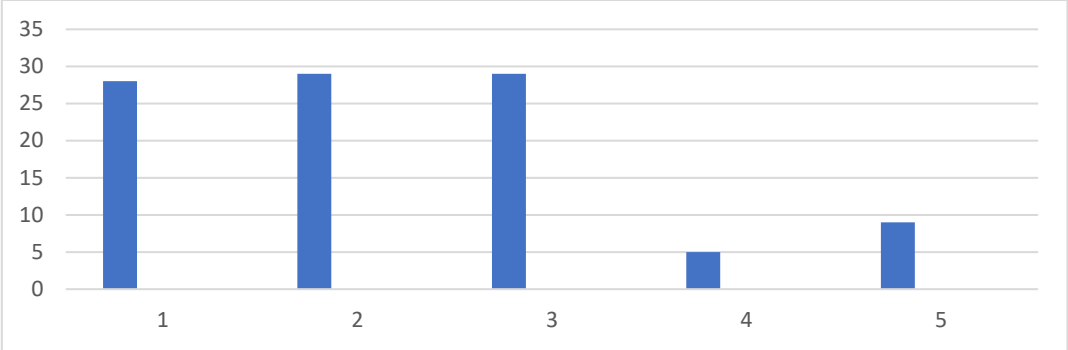
Question 10: What materials do you find most effective for working in an online classroom?



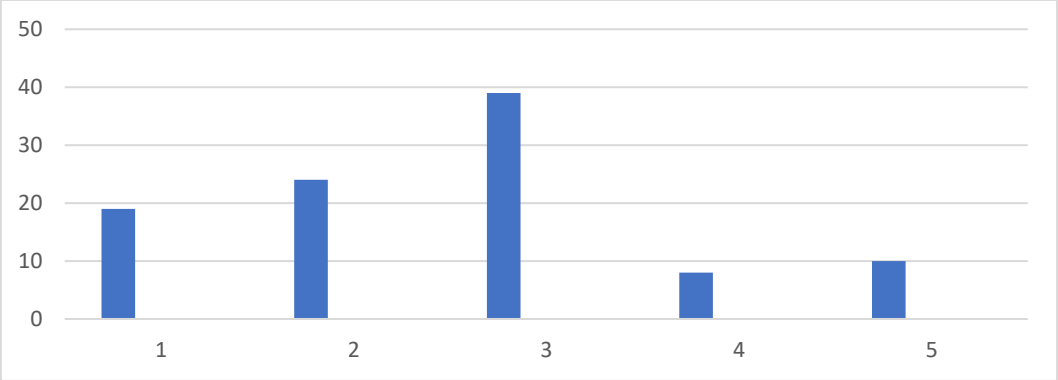
Question 11: To what extent do you lack online materials for learning Russian as a Foreign Language?



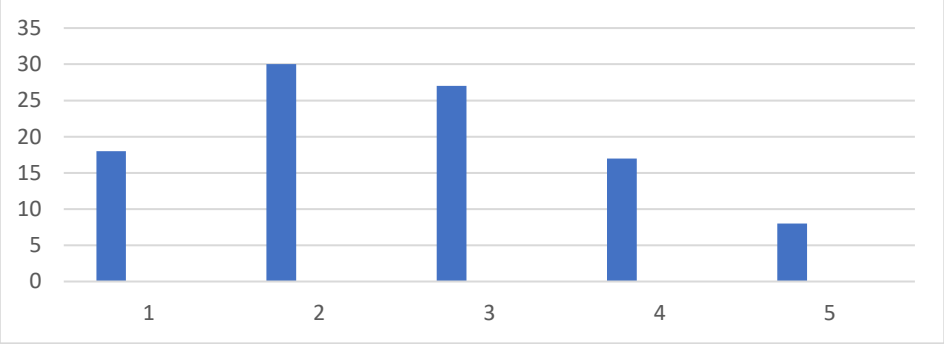
Question 12: How severely does your computer lack the technical capabilities necessary for an online lesson?



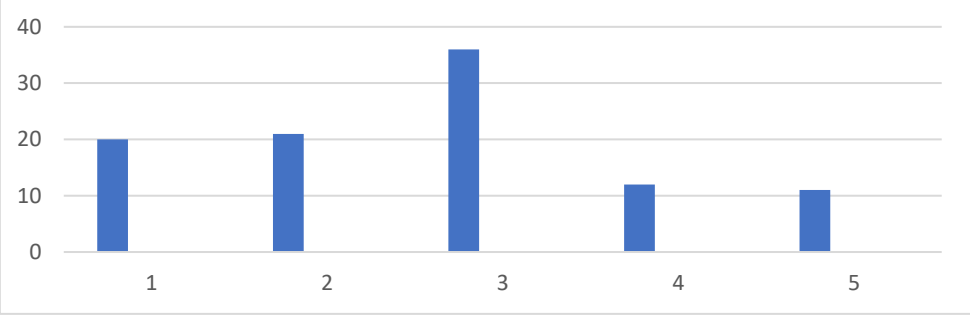
Question 13. How much do you miss the usual forms of learning in an online lesson (board work, working in pairs, game tasks)?



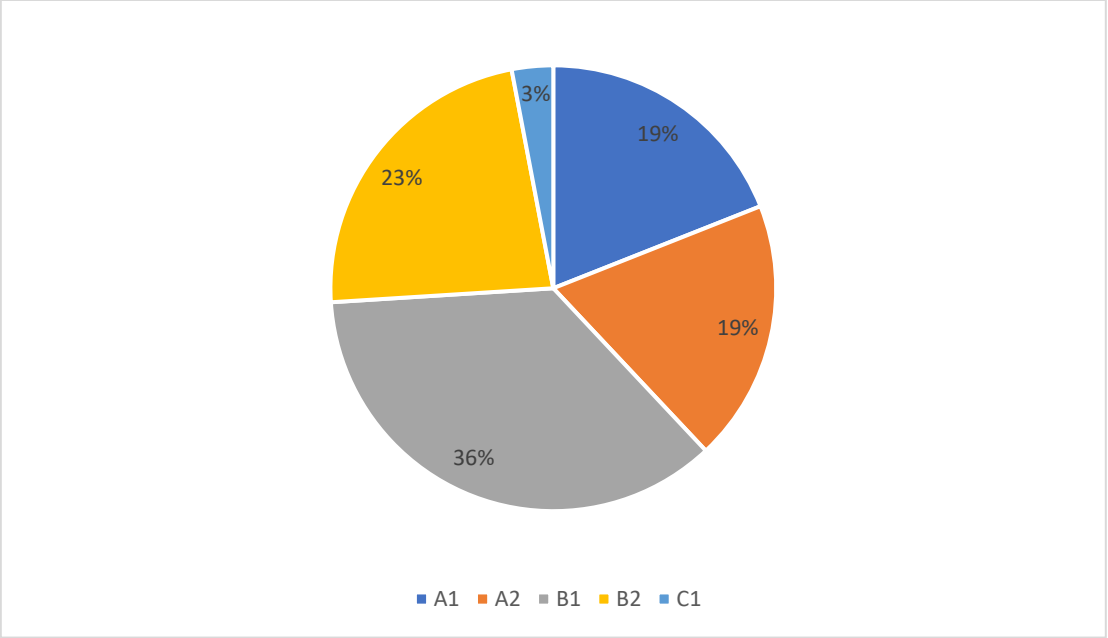
Question 14. How much emotional drive do you lack in the online lesson?



Question 15. How much self-discipline do you lack in an online lesson?



Question 16: What level group do you study in?



Editorial for EJEL Volume 19 Issue 1

Dear readers of the EJEL,

Please note that papers on covid-19 special issues have been published across the issues 19(1) and 19(4). The full editorial covering papers from both issues can be found in 19(4).

The EJEL editors.

Marija Cubric and Heinrich Söbke