Online examination session: teachers' and students' satisfaction level

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Abstract. This paper is aimed at defining the satisfaction level of students and teachers with online examination session. To implement the study, we conducted online surveys for 2nd year bachelor students and 1st year master students (N=97) and online interviews with teachers (N=12). The analysis of received data indicated that students felt more satisfied with online examination session than teachers due to a number of reasons. Firstly, elder teachers faced technical problems on some steps of examination session. Secondly, teachers worried about the reliability of students' testing results as they had access to any recourse or material and due to bad connection sometimes it was hard to hear or see students. Thus, some problems were revealed despite the general positive attitude to online examination session from students.

1 Introduction

The pandemic of Covid-19 impacted almost all spheres of social life including the organization of educational processes at universities all over the world. Students and teachers perceived these changes differently, depending on their personality type, age, psychological state and many other factors. The organization of educational activities has undergone multiple changes in the search for an optimal and convenient process for all its participants. The higher education system in Russia was not ready for drastic changes, so the adaptation to the new conditions of safe education took a long time [1, 2]. During this period, the model of teaching and conducting classes changed depending on the electronic resources used by the educational organization [3, 4]. Following the lessons, the examination session also changed its procedure.

At Peter the Great St. Petersburg university during the period of fall semester 2020 students were studying distantly. Seminars and lectures were conducted in Microsoft Teams, the additional materials as well as task and exercises were always available at Moodle website. The examination session was implemented in two ways: in a form of an online testing on the Moodle and in a form of discussion in Microsoft Teams. Despite all efforts of the teachers, these changes had a high influence on general level of students' academic performance.

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The aim of this paper is to reveal the satisfaction level of teachers and students with the online examination session and whether the format of examination session affected the students' academic performance.

1.1 Literature review

Virtual classroom teaching and online assessments are gradually replacing physical learning in the classroom and paper assessment [5]. In addition to the knowledge gained on the topic at hand, many factors influence the measurement of student performance in online assessment. Mood plays an important role in both classroom and online learning. Affective states such as emotions and mood affect students' cognitive skills, which in turn can affect their learning. In a traditional classroom setting, the teacher can change the teaching strategy according to the general mood and reaction of the students. On the other hand, in computer learning, such personalization can be achieved by assessing the mood of the individual student interacting with the system and changing the strategy accordingly.

Students' learning can be assessed using a variety of online tests and grades. A student's performance on a particular test indicates the student's level of learning in that particular subject in which the test was administered. A student's performance can be affected by various factors, such as the student's level of mental or cognitive fatigue on the test, which additionally depends on the time of day. Students tend to become mentally fatigued in the later hours of the day, resulting in poor academic performance. Academic performance is also influenced by other factors, such as the environmental conditions in which the test is conducted, the student's hunger level, lighting conditions and noise [6].

In addition, student emotions affect performance on the test. A common understanding of emotions is that they can enhance or hinder the mental as well as physical work performed by people. Positive emotions can speed up the process, while negative emotions interfere with the process. Learning also includes cognitive or mental tasks; therefore, it is very likely that he will be positively or negatively influenced by emotions [7]. Since student performance is indicative of learning and includes mental tasks, it is highly dependent on the student's energy level. Research has also shown that sleep affects emotional well-being [8, 9]. Sleep also affects learning. Sleep deprivation also impairs the function of brain structures important for cognitive processes such as language, working memory, reasoning, and creativity [10].

The word "emotion" is often applied to a wide range of psychological phenomena such as passions, feelings, temperament, personality, and mood. Although these words are usually used synonymously to perform various psychological functions and are grouped under the general term "affect" (or affective state) [11]. Affect consists of mood, emotions, relationships, episodes [12]. However, there is a noticeable difference between emotion and mood. We can say that the mood lasts longer than the emotion and the mood is not aimed at something or someone. For example, a person may be sad or cheerful for several days. Even if a person is not aware of this, he is still in a certain mood. On the other hand, emotions last for a shorter time and are directed or targeted specifically at a specific event or person. For example, you can be angry with someone or something [13].

Vosburg [14] stated that positive and negative emotions influence multidirectional thinking, quantity / quality of ideas, and creative problem solving. Moridis and Economides [15] recognized emotions during online self-assessment tests. The students took part in an online multiple-choice test in which they had to move the band of their emotional state from -100 to +100. It is a form of explicitly identifying emotions by respondents, based on the assumption that a recent correct or incorrect answer has an exponential effect on the student's emotions. Two categories of emotions, namely, positive and negative, were studied in relation to the recent correct or incorrect answer given to students in online testing.

Qi-rong [16] proposed a model for an intelligent learning system based on affective computation. The model describes four kinds of basic emotions, namely, acceptance, disgust, interest and doubt. Formal definitions of mood and emotion were formulated, and a link was established between emotion and the psychology of learning. Mathematical equations for emotions were also derived. The model uses a training agent. The facial expressions of the respondents are recorded to reflect the cognitive-psychological state of the student. Thus, the teacher can timely adjust his educational process. The student can find out the cause of the poor learning state and improve the learning effect with the improved suggestions that the learning agent has provided.

Ammar, Neji, Alimi and Gouardères [17] have developed an Intelligent Learning System (ITS) model that captures learner emotions during the learning phase with facial expressions. Emotional classification is based on changes in certain distances from a neutral person and takes into account the six basic universal emotions of Ekman, viz. anger, happiness, surprise, disgust, sadness and fear. The authors have combined peer-to-peer topology and e-learning to propose an emotional foundation for an intelligent affective system, which the author calls an emotional multi-agent peer-to-peer e-learning system (EMASPEL).

Graesser and D'Mello [18] modeled the emotions associated with learning, namely confusion, frustration, boredom, engagement / flow, curiosity, anxiety, delight, and surprise in a computerized learning environment. The study also explains why and how certain emotions arise during complex tasks. Emotion-sensitive AutoTutor detects student emotions and responds to them adaptively, improving learning and motivation.

Pardos, Baker, San Pedro, Gowda and Gowda [19] found a relationship between a student's exposure throughout the year on a web-based learning platform and year-end performance on a math exam. Subsequent analysis of the teacher's journal data allowed the student's affective state to be assessed, namely: boredom, engagement, concentration, confusion, and frustration using affect detectors.

Kritikha [20] proposed a system that detects and tracks student emotions in an e-learning environment and provides a real-time feedback mechanism to improve learning. In the proposed system, they used arousal, harassing, and moving eye and head movements to elicit meaningful information for understanding the mood of the student participating in the e-learning environment. The system also manages to determine if the student is interested and focused on the topic or not.

Pekrun, Goetz, and Frenzel [21] developed the Achievement Emotions Questionnaire (AEQ). The Achievement Assessment Questionnaire (AEQ) is a self-report tool designed to measure student emotions in academic situations. The main objective of this study was to adapt and validate this questionnaire to assess preschool emotions related to class and tests in relation to mathematics. It was attended by 1,515 Portuguese students in grades 5 and 7 (age range 10-13 years). Confirmatory factor analysis and descriptive statistics support the robustness and intrinsic validity of AEQ for pre-adolescent children (AEQ-PA), providing evidence that AEQ-PA is an effective tool for assessing preschool emotion in relation to math lessons and tests.

Student perception research is the most common approach to assessing the quality of universities [22-25]. This is done to improve quality in response to increased international competition for students and higher education operating funds [26-28]. Student satisfaction and academic performance have been the focus of both academics and policymakers in a competitive learning environment [29, 30]. Thus, the vital role of such factors as the educational program, the quality of the teaching staff, the availability of services, the learning environment and the university's capabilities in shaping student satisfaction and their academic performance is interesting and recognized in the educational literature [31].

For example, Goetz et al. [32] studied students' perception of the learning environment and emotions experienced in learning Latin. In their study, teacher enthusiasm, individually

perceived positive reinforcement of achievement, and detailed instruction in Latin were positively associated with individual reports of pride and pleasure, and negatively associated with individual reports of boredom and anger. But teacher pressure is positively associated with student anger and anxiety, and negatively with pride and pleasure in Latin. In addition, Fraser and Fisher [33], in their study of affective and cognitive outcomes in perceived classroom environments, found positive correlations between perceptions of participation, belonging, involvement, order and organization, task orientation and clarity of classroom rules, and the students' average enjoyment of science lessons [35].

2 Methods

The research included 77 bachelor students of the 2nd year of study, 20 master students of the 1st year of study and 12 teachers from the Higher school of Applied Linguistic, Psychology and Pedagogy. To collect the data, we conducted an online survey (for students) and online interviews via Microsoft Teams (for teachers). To prevent influence of final exam grade we surveyed students after the exams but before grading. The survey was based on assessing three indicators – Achievement emotions, Characteristic of online examination session and Satisfaction.

2.1 Achievement emotions

Four subscales were adapted from the Achievement Emotions Questionnaire developed by Pekrun, Goetz, and Frenzel [21] to measure students' emotions during the online examination session. A four-item enjoyment subscale, a three-item boredom subscale, a four-item anxiety subscale, and a four-item anger subscale assessed students' emotions. Students rate their emotions in a seven-point Likert scale from Strongly disagree (1) to Strongly agree (7).

2.2 Characteristics of online examination session

Students' perceptions of six online learning characteristics were measured with modified version of Goez et al.'s [32] scale. Each feature was measured by a single item. The items consist of (1) understandability (understandability of the vocabulary used in the online session period), (2) illustration (the amount of illustration that used in online modules to explain the material), (3) level of expectation (online session expectations from students), (4) difficulty (the difficulty of the online session), (5) lack of clarity (unclear instructions), (6) pace (the pace of exam). The items were scored on a 7-point Likert scale (Strongly disagree = 1 and Strongly agree = 7).

2.3 Satisfaction

Artino's [34] three-item scale was adapted to measure students' satisfaction with an online examination session. Items were answered on a 5-point Likert-type scale. Higher scores indicated students are more satisfied with the online examination session.

2.4 Online interviews

The online interview lasted approximately 30 minutes and included five main questions:
1. Are you satisfied with the process of conducting the exam session remotely?
2. What are the advantages of the distance format for conducting an examination session, can you highlight?

3. What are the disadvantages of the distance format for conducting an exam session?
4. What difficulties did you face during the examination session?
5. In your opinion, are the results of the examination session conducted remotely reliable?

The teachers' answers were recorded with their agreement, after which the notes were used for a more detailed analysis. Among the 12 teachers participating in the interview, 25% are men, thus the majority of the interviewed are women. This is due to the teaching staff, which is dominated by female teachers. The average age of the respondents is 42 years.

3 Results

3.1 Students' survey results

The results of survey on the achievement emotions indicators are presented in Figure 1.

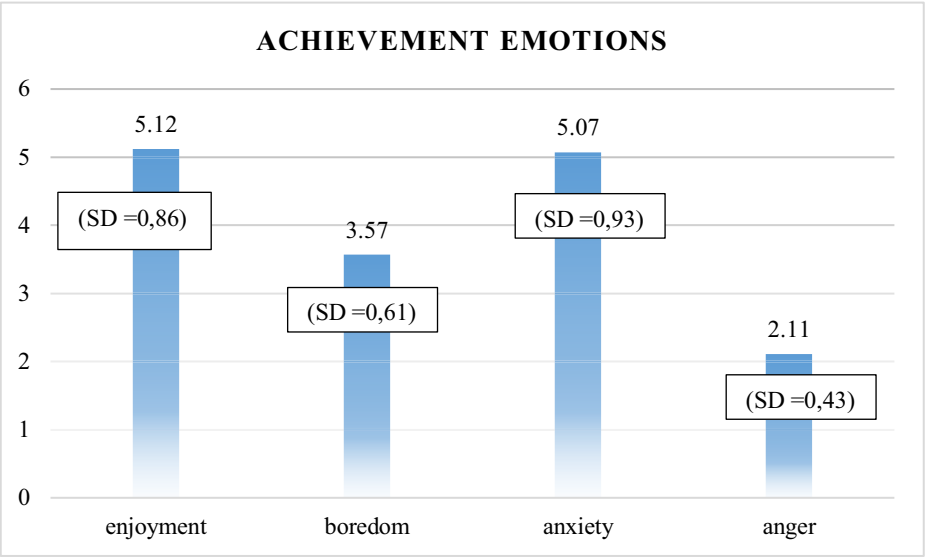

Fig. 1. Survey results on the achievement indicator.

Due to the information in the Figure 1, students felt more enjoyment then boredom during passing the online exams. At the same time students indicated the presence of anxiety feeling. The anger indicator was low.

The results of survey on characteristics of online examination session are presented in the Figure 2.

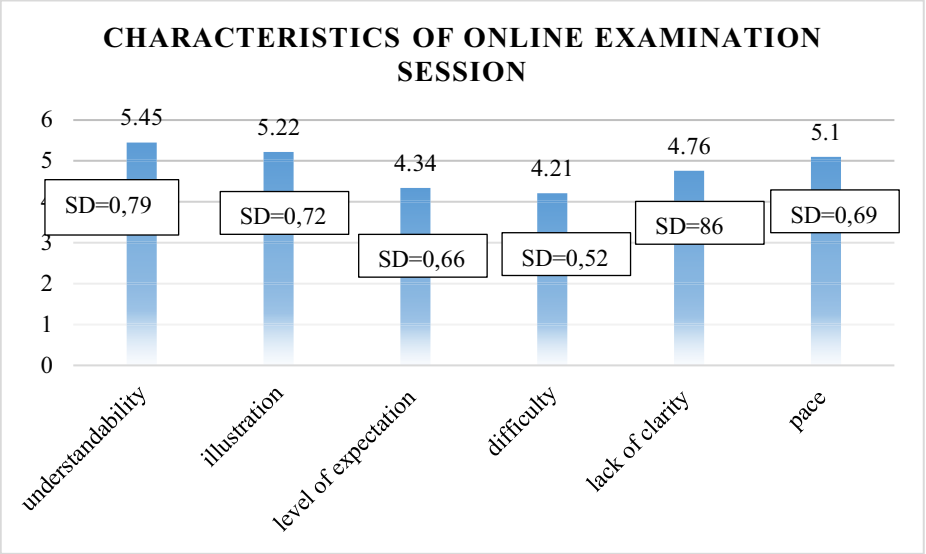

Fig. 2. The results of survey on characteristics of online examination session.

In general, students evaluated the online examination session positively. Such indicators as "understandability", "illustration" and "pace" gained the highest scores. At the same time students indicated that online exams seemed to be quite difficult for them (it can be connected with the factor of novelty).

According to the authors [36] 2.5 is an accepted mean for student satisfaction, when a 5-Likert scale survey is conducted. In this case we decided to divide the results of students' survey to those who is satisfied (mean - more than 2,5) and those who is not satisfied (mean – less than 2,5). The results are reflected in Figure 3.

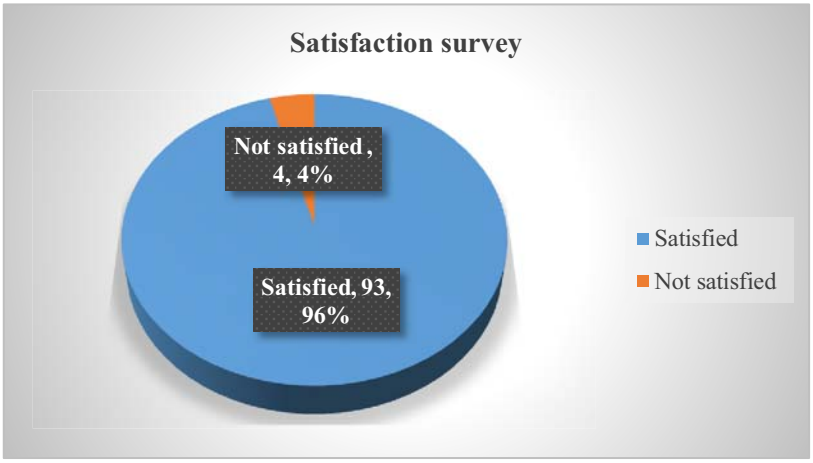

Fig. 3. The results of satisfaction survey.

Due to results it can be concluded that 93 students are satisfied with online examination session, while 4 students are not satisfied.

Also, we conducted t-test on the group of overall student satisfaction with online examination session, to evaluate whether the mean was significantly different from 2.5 - an accepted mean for student satisfaction.

Table 1. Results of t-test.

Indicator	Mean*	Mean	SD	t-value
Satisfaction	2.5	2.69	0.71	1.8

* p<0,05; ** p<0,01; ***p<0,001.

Despite the fact that general level of students' satisfaction can be considered as positive, the difference between average mean and accepted mean is not significant.

3.2 Teachers' interview

The results of the interviews varied significantly depending on the age of the respondents. After analyzing the answers of the teachers, we came to the conclusion that teachers over 45 years old have a negative attitude to the remote format for conducting an examination session, as they encountered technical problems and they did not have enough knowledge about working with electronic resources. Teachers under the age of 45 did not experience such problems.

Studying the answers in more detail, we can conclude that the satisfaction of teachers with the online examination session is low, regardless of the age and gender of the teachers. However, positive aspects were noted.

Five teachers appointed testing as a control of knowledge during the session. These teachers noted the convenience of the electronic format, since the tests performed are checked by the program automatically, which significantly reduces the teacher's work time, allowing only to analyze the students' results. In addition, there is no need to print tests and bring them in paper form. In addition, all the teachers emphasized the convenience of working online in general, the absence of the need to travel to the university.

As disadvantages, most teachers (9 out of 12) noted that they spent much more time on conducting an online oral exam than they would have done in a traditional format. Also, teachers who offered students to take the test noted that it takes a very long time to compose a test, upload it to an online platform and set up all passing functions. Older educators needed to refer to training materials to operate the online platform and download online tests.

Among the teachers' answers to the fourth question about difficulties, 3 points can be distinguished:

1. Technical problems for both students and teachers. The main problem is the inability to predict such problems, and often the inability to solve the problem, since it depends on the Internet connection provider or computer. Thus, the prepared students did not take the exam due to technical problems and had to take the exam in extra time.
2. Students feel much more relaxed and some are disrespectful. This behavior is common among teenagers on the Internet.
3. It is impossible to check whether the student decides the test independently or uses auxiliary materials and the help of third parties.

The latter issue calls into question the reliability of the online exam results. The results of the students during the online exam session were high, but it cannot be argued that such performance is a real result of student learning. For this reason, most teachers are dissatisfied with conducting an online exam session.

4 Discussion

The results of the student survey and interviews of teachers showed two opposing opinions about the online exam session. Students noted the positive aspects of the online format for conducting the exam session. Despite the excitement during the exam session, the students felt enjoyment.

In addition, students were less likely to feel angry, which reduces the negative attitude towards the exam session, the subject and the teacher in general. In general, students evaluated the online examination session positively.

Students note that the online exam session was difficult, which may be due to the novelty of the procedure. But at the same time, students note that the work with the examination materials was clearly explained. Thanks to clear instructions, the speed of passing the exams was well rated by the students.

Thus, among students, general satisfaction with the online exam session can be noted. However, the teachers have a different opinion.

Teachers faced more difficulties than students. This can be explained by the age of the teachers (the average age of the interviewed teachers is 42 years). Some trainers needed to seek help and advice due to the lack of technical knowledge on the use of electronic resources. But the main problem identified in the process of interviews with teachers is the question of the reliability of the results of the examination session. Teachers note that it is impossible to control whether the student will complete the assignments on his own or use additional materials and the help of third parties.

5 Conclusion

The transition to online learning caused by Covid 19 had a significant impact on students' and teachers' behaviors and perceptions of educational process. In this research we tried to reveal whether students and teachers were satisfied with online examination session in Peter the Great St. Petersburg university. To implement the study, we surveyed students on their emotions during the examination session, characteristic features of online exams from their respective and general level of satisfaction. Teachers underwent online interviews and indicated their attitude toward online examination session as well as noted the main difficulties. Based on the results we gained it could be concluded that students felt more comfortable in online environment during examination session than teachers. Teachers raised such problem as the reliability of the results of the examination session.

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