



## LEARNING IN A BLENDED LEARNING ENVIRONMENT: NEEDS AND INFLUENCING FACTORS

**A. Uukkivi**<sup>1</sup>

TTK University of Applied Sciences  
Tallinn, Estonia  
ORCID 0000-0002-9490-4849

**O. Labanova**

TTK University of Applied Sciences  
Tallinn, Estonia

**T. Murulaid**

TTK University of Applied Sciences  
Tallinn, Estonia

**K. Nõuakas**

TTK University of Applied Sciences  
Tallinn, Estonia

**B. Petjärv**

TTK University of Applied Sciences  
Tallinn, Estonia

**V. Retšnoi**

TTK University of Applied Sciences  
Tallinn, Estonia

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<sup>1</sup> A. Uukkivi

[anne.uukkivi@tktk.ee](mailto:anne.uukkivi@tktk.ee)



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## **ABSTRACT**

In blended learning, students have the opportunity to choose either online or classroom lectures. For higher education institutions, blended learning has many advantages, such as accessibility to students and teachers, cost efficiency, alleviation of the teacher shortage, etc. But what does this mean for the students?

The aim of the study is to find out students' further need for blended learning, its reasons and factors influencing it. An online survey was conducted to answer the research questions. The collected data was analyzed by using statistical analysis methods.

The results of the survey revealed that the technical prerequisites for students to participate in blended learning were met. The biggest problems are related to the self-regulation skills of students. Problems with blended learning are stronger among first-year students. However, the respondents were rather positive about blended learning. Blended learning is most strongly supported by distance learning students who live far from university and are over 25 years old. The least supportive of blended learning are full-time students living near of the university and who are under the age of 25. This is due to the fact that full-time students experience blended learning problems on average more often than distance students because of the weaker learning skills.

The results of the survey help to understand students' views on blended learning, to plan and conduct studies in a student-friendly way, and to plan trainings for teachers to improve the blended learning process.



## 1 INTRODUCTION

### 1.1 Aim and research questions

The learning experience of students is influenced by the professionalism of the teacher. It makes it easier to understand what is being learned and diversifies learning [1]. The COVID-19 crisis tested the professionalism of teachers. The contribution to the development of teachers' digital and pedagogical competencies, as well as the continuous development of teaching infrastructure, have made it possible to organize blended learning at TTK University of Applied Sciences (TTK UAS) during the COVID period. In order to find out students' satisfaction and further expectations, the university conducted a survey "How to support learning in blended learning?" The aim of the survey was to find out students' further need for blended learning, its reasons and factors influencing it. In order to achieve this goal, the following research questions were set:

- What are the conditions for participating in blended learning?
- What are the main problems experienced in blended learning?
- How do students evaluate the first blended learning experience in their studies?
- What is the profile of the proponents and opponents of blended learning?

### 1.2 Background

Blended learning is defined in TTK UAS [2] as a form of study in which it is possible to successfully participate in studies either in the classroom or via the web. Conducting blended learning is a challenge, as it requires the teachers to reshape their approach to teaching and the students to get used to the renewed learning environment and conditions [3]. Issues in blended learning have been studied extensively. One of the aspects that emerges is lack of students' self-regulation skills. Self-awareness and self-motivation have a direct, positive, and significant impact on study habits, but it is concluded that students face higher-than-usual challenges in building study habits in blended learning [4]. According to Susanna et. al [5] there is a positive influence between self-regulation and motivation on student learning outcomes in a blended learning approach as well. Rasheed et.al states, that the implementation of blended learning in higher educational institutions is increasing due to its perceived effectiveness in affording the benefits of both face-to-face traditional mode and the fully online mode of instructions. However, the leading challenge associated with the online component of blended learning is students' inability to properly self-regulate their learning activities [6]. But, students are obliged to regulate, manage and carry out their study activities and learning tasks independent of their instructor, at their own pace, and also using online technology for in the online component of blended learning, but they encounter here with problems [7]. Kotturi et.al argues that one of the main challenges that students face in an online environment and a more importantly online component of blended learning is self-regulated learning due to the learning flexibility and autonomy granted to students [8]. According to Adnan and Anwar [9] students who have high

motivation in conventional learning, do not necessarily have the same motivation for blended learning. According to Lim and Morris [10] and Kassner et al. [11], students' age and preference for the form of study are the factors that differentiate learning outcomes between students either. Based on the foregoing, it can be pointed out that in studies related to the implementation of blended learning, it is necessary to pay attention to these factors.

## 2 METHODOLOGY

To respond the research questions, the online survey was conducted. The survey form consisted of four parts: conditions for participation in blended learning (6 questions), blended learning experience (8 questions), organisation of blended learning (4 questions) and demographics (6 questions). With the multiple-choice or scale questions the students were asked to evaluate the effectiveness of blended learning, their satisfaction and how willing they would be to learn in blended learning in the future. The open-ended questions identified the factors supporting blended learning, which is not in the scope of this paper. The survey form was made by using Google Forms and it was sent to all TTK UAS students in spring 2021.

In order to analyze the data the following statistical analysis methods were used. The Likert scale was used to weigh the questions, and an overview of the results of the survey was presented in the form of text, figures and tables. The differences between groups were checked by using descriptive statistics on the means and standard deviations. Correlations between variables were examined using the Spearman rho correlation coefficient, and internal reliability was measured using the Cronbach's alpha coefficient [12]. Based on the survey, various statistical hypotheses were formulated and their validity were checked by an appropriate statistical method. The quantitative statistical analysis was performed with MS Excel and statistical software R. If there no statistically significant differences were found in some of the groups (eg full-time/distance students), then this group was not considered separately in the analysis.

## 3 RESULTS

### 3.1 The structure of study participants

In the 2020/21 academic year, the total number of TTK UAS students was 2931, of which 570 students responded to the survey. Thus, the response rate in the population was approximately 20%. The first-year students responded the most actively (38%), followed by the second-year (32%), third-year (20%), fourth-year (9%) and time limit extension (1%) students. Among the respondents there were more distance students (64%) than full time (35%) and external (1%) students. The respondents came from all institutes (Fig.1), with the largest number of responses coming from students in the fields of transport and logistics (11%), building construction (11%), accounting (10%), social work (9%) and production management (9%).

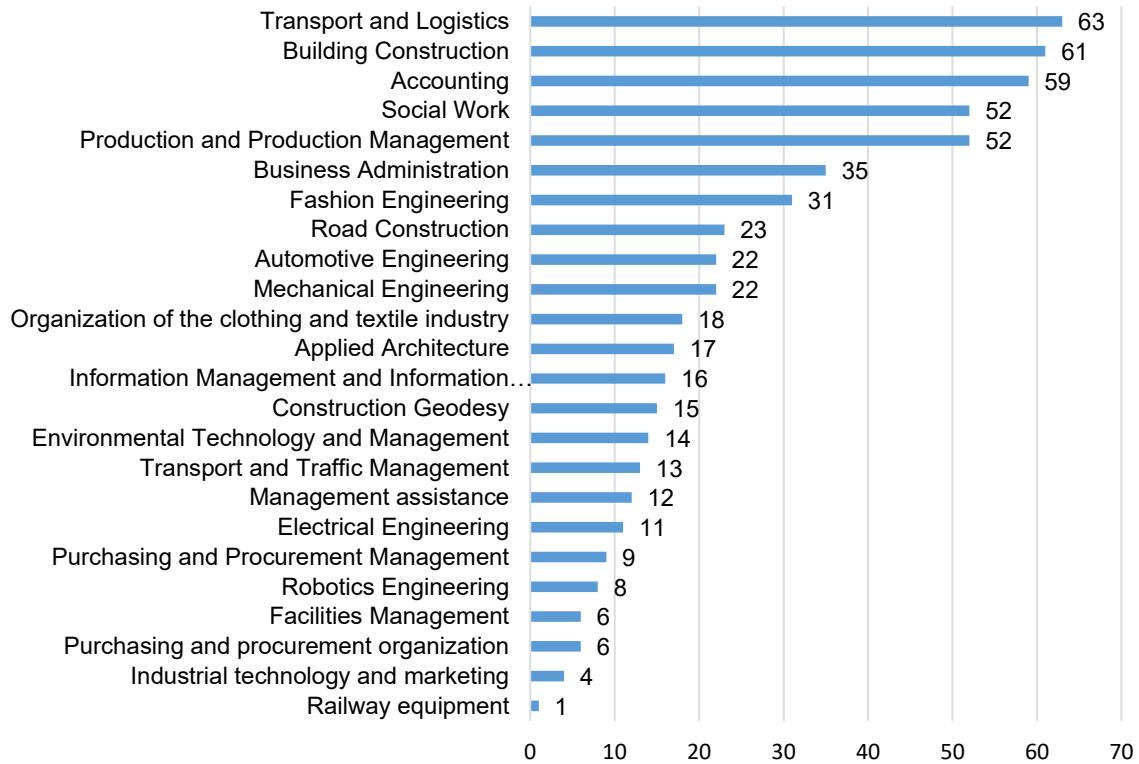


Fig. 1. The structure of study participants

The highest number of respondents coming from the younger age group under 25 years old (47%), with fewer and fewer respondents from each subsequent age group: 26 to 35 years old (27%) , 36 to 45 years old (20%), 46 to 55 years old (5%) and over 56 years old (1%). The highest response rate was among students from Tallinn (39%), followed by learners from rural areas (24%), from other cities (21%), from bigger cities (15%) and from outside of Estonia (1%).

### 3.2 Technical conditions for remote participation

Based on the results presented in Table 1, it can be concluded that there are no major problems for students to participate remotely in blended learning process due to technical conditions.

Table 1. Technical conditions for remote participation

Technical condition	Yes	No
Private room	82,8%	17,2%
Computer	99,5%	0,5%
Stabile internet connection	92,8%	7,2%
Webcam	94,4%	5,6%
Microphone	98,6%	1,4%

It is a common belief that students use a mobile phone a lot, but only 13% of the respondents used a mobile phone when participated remotely. This is a small proportion, but a potential danger, as it is not possible to carry out all tasks in a high-

quality way using a mobile phone alone. For example, if it is necessary to solve tasks with a teacher or view a teacher's drawings for which the screen of a mobile phone is too small, etc.

### 3.3 Problems in blended learning

The survey revealed that students most often experienced problems in the following aspects: 29% of respondents often experienced difficulties with concentrating, 28% stated that they often felt a decrease in self-discipline and learning motivation, and 26% felt that remote learning often remained superficial. The above results are explained and supplemented by the students' answers, in which problems related to the organisation of studies were seen as barriers for the effective learning (approximately 19% answered "often"), about the same number (18%) experienced a communication barrier with the teacher and other students, and 16% assessed their own learning skills as insufficient for remote participation. The increase in the volume of learning during the blended learning period was felt by 26% of the respondents, and 25% of the respondents also pointed out some technological problems. The remaining problems were mentioned less frequently: the environment is not supportive enough when participating remotely (15%), teacher's attitude (14%), cannot find the necessary information (11%) and the volume of learning decreases in blended learning (6%).

The analysis showed that first-year students experienced 40% more different learning difficulties than older students.

### 3.4 Blended learning experience

Students' evaluation of the efficiency of blended learning was rather good (on a 6-point scale the mean is  $M=4,19$  with standard deviation  $SD=1,08$ ). The students believed that the learning outcomes in the conditions of blended learning were partially achievable (on a 5-point scale  $M=4,02$ ,  $SD=0,95$ ). The general attitude of students towards blended learning was rather positive (on a 5-point scale  $M=4,05$ ,  $SD=0,96$ ). In the future, students wanted to attend an average of 50% to 60% of the lectures at a distance (on a 7-point scale  $M=4,24$ ,  $SD=1,67$ , mean confidence interval is  $4,24 \pm 0,14$  with 95% confidence level).

It was also analyzed how the answers to the previous questions are related to the students' form of study, age and distance between the university and place of residence.

*Table 2. Mean scores and standard deviations of variables (except for external students and students living abroad)*

Variable/Form of study	Full-time students		Distance students	
	mean	SD	mean	SD
Efficiency of blended learning (1...6)	3,77	1,08	4,40	1,01

Achievability of learning outcomes (1...5)	3,68	1,02	4,20	0,87
Attitudes towards blended learning (1...5)	3,67	1,01	4,24	0,87
Problems related to blended learning (14-40)*	27,65	5,71	24,94	5,72
Willingness to participate in studies remotely (1...7)	3,62	1,57	4,59	1,60

\* Students were asked to rate the incidence of 14 problems related to blending learning according to the 3-point scale: not at all - 1, rarely - 2, often - 3. The values of the variable are obtained by summing the individual points, where the minimum possible sum is 14 and the maximum possible sum is 42.

In the Table 2 there is a difference between the means of two groups of students. It shows that distance students rate the efficiency of blended learning higher than full-time students. Distance students believe that learning outcomes are achievable in blended learning, they are more positive about blended learning and they are more likely to participate in distance than full-time students. On average, full-time students experience blended learning problems more often than distance students.

There also appear the difference in mean scores depending on age. In the age group up to 25 years the mean scores are lower than in other age groups. This statement is in line with the previous results, because the most full-time students are under 25 years old.

There appear statistically significant moderate correlations between pairs of variables from Table 2. Positive correlations show that the higher the students' appreciation of the benefits of blended learning, the more positively they wanted to participate remotely (Spearman's rho 0,77), and the more they believed that the learning outcomes of the subjects in blended learning were achievable (Spearman's rho 0,75). The opposite relationship also applies.

The positive correlation coefficients are in range from 0,59 to 0,77, confirming a uniform strong positive relationship between variables. In order to obtain an assessment of the students' first experience in blended learning, a characteristic group of blended learning variables was formed, in which only positively correlated variables were included. The reliability within the group of variables of the flexibility assessment is high (Cronbach's alpha coefficient 0,87), which means that the average correlation between the variables is uniformly strong and there is an internal consistency of the variables.

The negative correlations between variables show that the more often students experienced different problems with the remote participation, the lower they rated the benefits of blended learning (Spearman's rho -0,64), the less often they wanted to participate remotely (Spearman's rho -0,49) and the less they believed that the





learning outcomes in blended learning are achievable (Spearman's rho -0,54). The opposite relationship also applies.

The further away the distance students live, the more positive they were about blended learning, the higher they valued the benefits of blended learning and the more often they wanted to participate remotely. In the case of full-time students, a statistically significant weak positive correlation has been found between the distance from the educational institution to the place of residence and their willingness to participate in studies remotely.

### **3.5 The profile of a supporter and an opponent of blended learning**

In order to get the answer to the one of the research questions of this study, the profile of the supporter and of the opponent of a blended learning was determined according to the demographic data. The supporter of blended learning is a distance student, who does not live close to the educational institution and is over 25 years old. The opponent of blended learning is a full-time student, who lives close to the educational institution and is under 25 years old.

## **4 SUMMARY AND ACKNOWLEDGMENTS**

The survey showed that the technical prerequisites for students to participate in blended learning are met, as the vast majority have access to a private room, computer, Internet connection, microphone and speakers. Instead, the biggest problems are related to students' self-regulation skills, ie difficulties related to concentrating, self-motivation and superficial learning. Participating in blended learning at a distance requires even more self-discipline and an awareness of how to manage one's own learning so that learning does not remain superficial. Problems with blended learning are stronger among first-year students. However, the respondents were rather positive about blended learning. This shows that students perceived the need for blended learning and also the fact that blended learning has become a so-called new reality that will continue in the future. Blended learning is most strongly supported by distance learning students who live far from university and are over 25 years old. Blended learning helped increase access to the learning process. The least supportive of blended learning are full-time students living near of the university and who are under the age of 25. This is due to the fact that full-time students experience blended learning problems on average more often than distance students because of the weaker learning skills. Thus, the modern learning process requires the university to teach self-regulatory techniques in parallel with the mediation of learning content.

The results of the survey help to understand students' views on blended learning, to plan and conduct studies in a student-friendly way, and to plan trainings for teachers to improve the blended learning process.

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