How Students Perceive Online Teaching IT Subjects within the MS Teams Environment

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Abstract. The presented research had two primary goals. The first goal was to determine students' attitude to lectures and exercises conducted through the MS Teams application. Students' attitudes to online teaching were identified by the students' activity within the subject Business Processes Modeling and students' opinions on the acquired knowledge's usability and applicability. Another goal of the research was to determine whether gender influences the perception of online teaching by students. The obtained results indicate that the MS Teams application lectures are more acceptable for students than face-to-face lectures. Also, in such a lecture, students are more active, more often asking the teacher questions. Surprisingly, MS Teams exercises are not considered more useful by students than face-to-face exercises. The results further showed that women assigned lower values to most factors than men. The results of the research predict the influence of gender on students' attitudes to online teaching. Additional, It would be necessary to determine whether the difference between men and women's average values is statistically significant. This difference can be verified in a larger group of respondents. Therefore, we plan to continue the research.

Keywords: MS Teams, online education, attitude, computer subjects, digital technologies

1. Introduction

Lectures and exercises are an essential part of an effective learning process. [1] Recently, it can be noted that the role of MS Teams-type technologies in teaching has grown to the point where we can talk about online education. Online learning can be defined as a process in which digital technologies are used to support and manage the teaching process. [2] In other words, online education deals with methods, processes, and web-based software tools (or systems) that enable students to acquire knowledge and skills with teacher support systematically. [3-5]

The growing number of reports on online forms of training courses is not surprising, given the potential benefits of this approach. These include (compared to traditional methods of education) cost and time savings due to access at any location[6]; a space for providing feedback that may have pedagogical benefits [7]; increasing the level of student activity due to the relative novelty and attractiveness of this approach[8]; increased flexibility [9], such as allowing students to submit assignments at a distance without having to come to a school. Some studies have tried to measure attitudes and perceptions of online learning methods, e.g. the authors in [10] proposed a model that predicts students' attitude to online education. However, there is a clear need for further studies to examine students' attitudes, perceptions and preferences regarding online learning methods, as the evidence to date remains largely inconclusive.

Numerous research studies have shown that the use of digital technologies helps to improve the educational process in informatics. [11] To support and improve the development of students' IT skills at universities, we have proposed a new teaching model. [12] The model emphasizes continuing education, activity, independence and creativity [13] and contains blocks of training as well as assessment and a database of tasks that require the application of knowledge. The acquisition of knowledge, which is part of the new teaching model, has been substantially reworked and adapted to technology. Because students were not used to this form of conducting lectures and seminars, we researched students' acceptance of online education.

2.   Research goals and methodology

The research had two main objectives. The first goal was to find out students' attitude to lectures and exercises realized through the application of MS Teams. Students' attitudes to online education were identified by the students' activity in the subject and students' views on the applicability in the study of other subjects and the usability of the acquired knowledge and skills in practice. Another goal of the research was to find out whether gender affects students' perception of online education. Based on the above objectives, we have defined the following research questions:

•   What is the semantic profile of lectures and exercises implemented through the MS Teams application in terms of selected factors?
•   What is the semantic profile of lectures and exercises conducted through the MS Teams application in the group of men and the group of women?

We used a questionnaire based on Likert scales to answer the research questions. Attitudes towards the subjects were measured using several 5-point scales in terms of selected factors. A value one corresponded to a negative attitude, and a value five corresponded to a positive attitude on a 5-point scale. Based on the completed questionnaire, we created a semantic profile of lectures from the subject Business Process Modeling regarding preference, activity, applicability in study and practice and readability of documents. We also created a semantic profile of exercises from the subject in terms of factors of preference, applicability in the study, the volume of acquired knowledge and usefulness.

Preference was expressed by students' preferences toward lectures/exercises through MS Teams or face-to-face lectures/exercises. Activity is expressed by comparing the number of questions addressed to the teacher in an online lecture compared to a face-to-face lecture. Applicability expresses the students' opinion on using knowledge and skills acquired in the online lecture in further study and practice, for example, when working from home. The readability of texts is expressed by whether the student is satisfied with more materials that the teacher shares through the MS Teams application compared to the materials projected in the face-to-face lecture. The volume of knowledge expresses the student's opinion on whether he will learn more in online exercises than in face-to-face exercises, as he knows how the teacher guides his classmates in solving their projects. Usefulness is expressed by the fact whether students consider the exercises through the MS Teams application to be more useful than face-to-face exercises.

The group of respondents consisted of 38 first-year students of the engineering study program Economic Informatics at the Faculty of Economic Informatics of the University of Economics in Bratislava (FHI EU). At the end of the semester, we asked students to fill out an anonymous e-questionnaire. The return rate of the questionnaire was 53%. The questionnaire was completed and submitted by 20 students. Of these, 30% were women, and 70% were men. The group included 85% of students who completed the bachelor's study program in Economic Informatics at FHI EU. The remaining students completed another program at the Faculty of Economic Informatics or a program at another faculty of the University of Economics in Bratislava.

3.   Research results and discussion

3.1.   Results for the whole group of respondents

The overall results (Fig. 1) showed that students watching lectures through the MS Teams application perceive them as more comfortable than personal lectures (M = 4.15). Lectures through

the application would be recommended to use in university studies (M = 4.40). They agree that the skills acquired in online lectures can be used later in the job, e.g. at work from home (M = 4.20). The materials' readability is better for them when the teacher shares the materials through the application compared to the materials projected in the presence lecture (M = 4.20). The average values of all four factors used to determine students' attitudes to teaching through MS Teams are higher than the fourth level on the Likert scale, which represents a positive attitude (a value of the third level represents a neutral attitude and a value of the fifth level a highly positive attitude). A slightly positive attitude was expressed only in a questionnaire item with the information that in the lecture through MS Teams, students ask questions more often than in the face-to-face lecture. (M = 3.3)
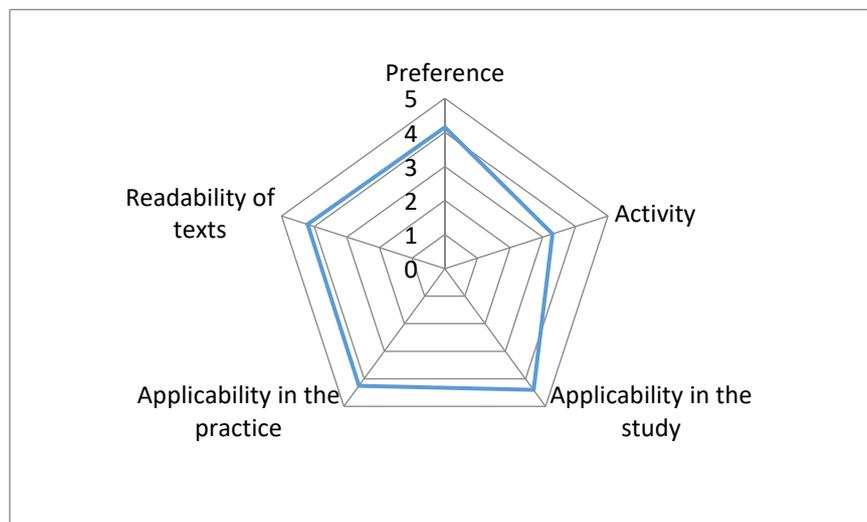

Figure 1: Semantic profile of lectures through MS Teams

The situation is different in students' attitudes to the exercises conducted through MS Teams application (Fig.2). Such exercises do not suit students more than face-to-face exercises (M = 2.95). Students assigned a low value to the recommendation to use this form of exercise in another study (M = 3.1). They also very weakly agreed with the statement that they would learn more in the exercises through the MS Teams application than in the face-to-face exercises (M = 3.1). Little did the fact that students know how a teacher guides classmates in solving their projects seeing directly in their screens teachers correction of classmates mistakes. Students did not consider exercises through MS Teams more useful than face-to-face exercises (M = 2.85).
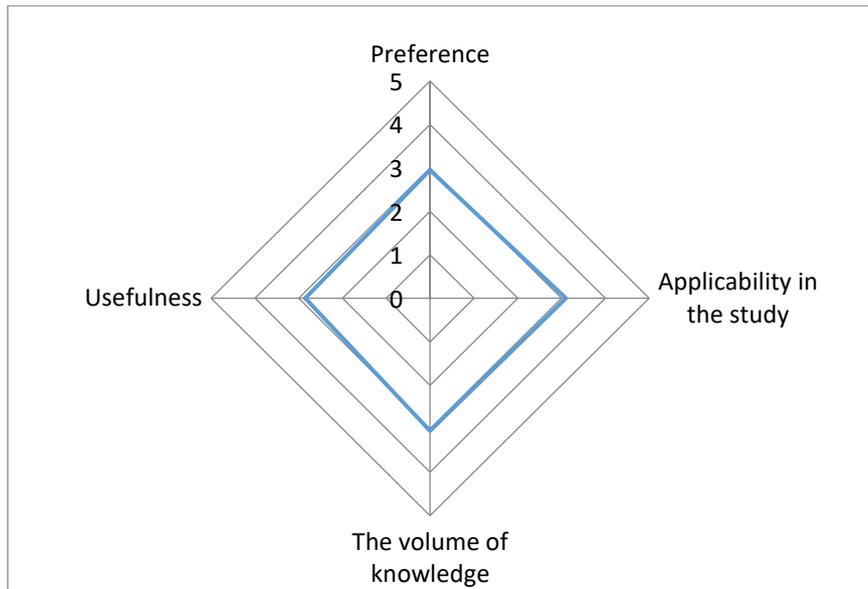
Figure 2: Semantic profile of training through MS Teams

3.2.   Results for the group of women and men

As can be seen from Fig. 3, the semantic profile of online lectures in a group of men is similar to the semantic profile in the whole group of respondents. In the group of women, it differs in the factor of readability of texts. Women perceive this factor with a lower average value (M = 3.5) than men and the whole group of respondents.
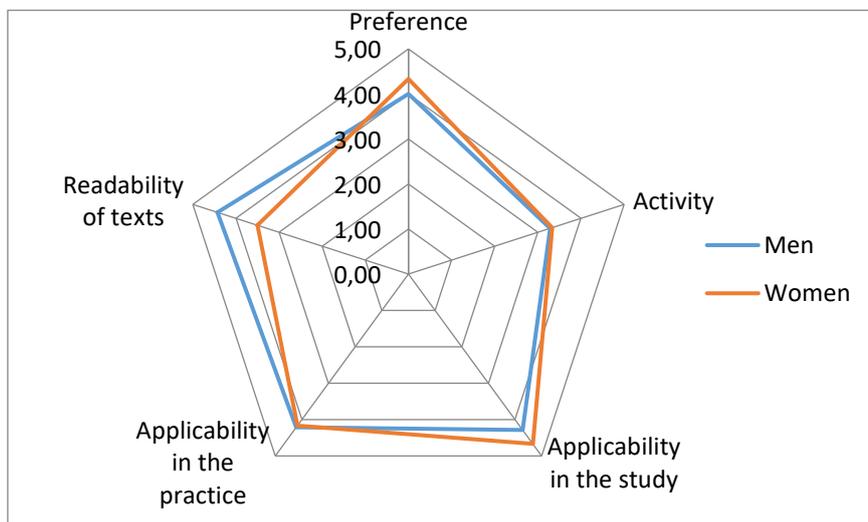

Figure 3: Semantic profile of online lectures in a group of men and women

The obtained results suggest that although men and women assigned different average values to the readability of the materials from the subject, both groups were marked as better readable materials shared by teachers in the online lecture than the materials projected in the face-to-face lecture. The result confirmed our assumption.
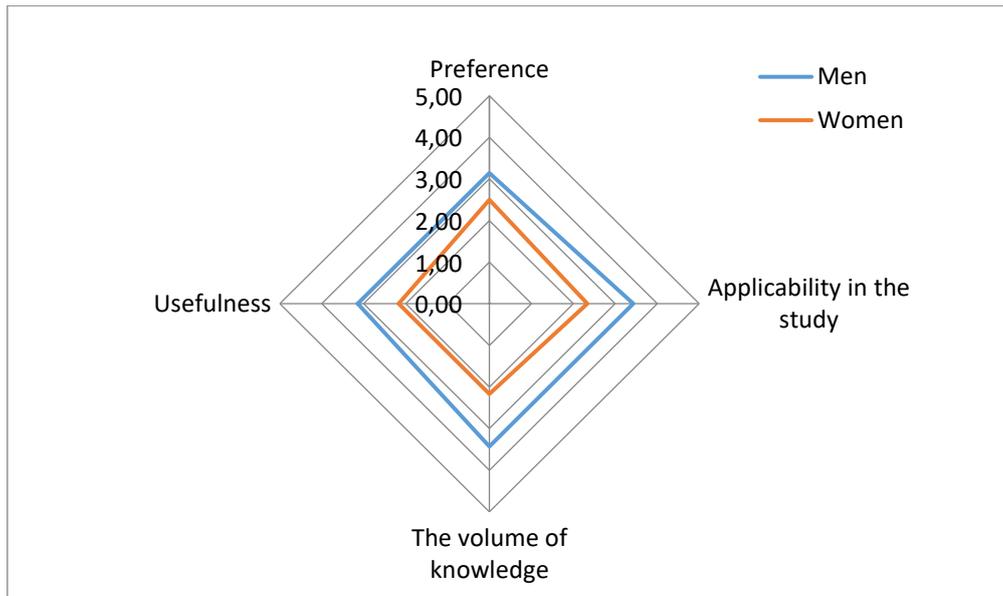
Figure 4: Semantic profile of online training in a group of men and women

In the semantic profile of the online exercise (Fig.4), we got a similar result. Again, the semantic profile in the group of men is visually similar to the semantic profile in the whole group of respondents, although men assigned higher values to all factors. The factor of online exercise preference is different, where men assigned an average value of M = 3.14, which corresponds to a weak agreement; in contrast, in the whole group, the average value was only 2.95.

However, the group of women's semantic profile differs from the semantic profile for exercise in the whole group. Women assigned lower values to all factors than men. All average values are in the area of disagreement. The results of our research predict that gender influences students' attitudes to online exercises. To determine whether the differences in average values are statistically significant, we plan to repeat the research for a larger group of respondents.

The obtained results showed that students' attitude to online lectures is positive (M = 4.15). 80% of students expressed their opinion, as can be seen from Fig. 5, which contains students' answers to one of the questionnaire items. Only 15% (3 out of 20) of students expressed a negative attitude, and only one student has a neutral attitude to online lectures.

Also, the results suggest that attitudes toward online education are influenced by gender. This fact surprised us, as we expected the acceptance of online education in the group of men and women to be the same. This result needs to be verified statistically on the data of a larger group of respondents.
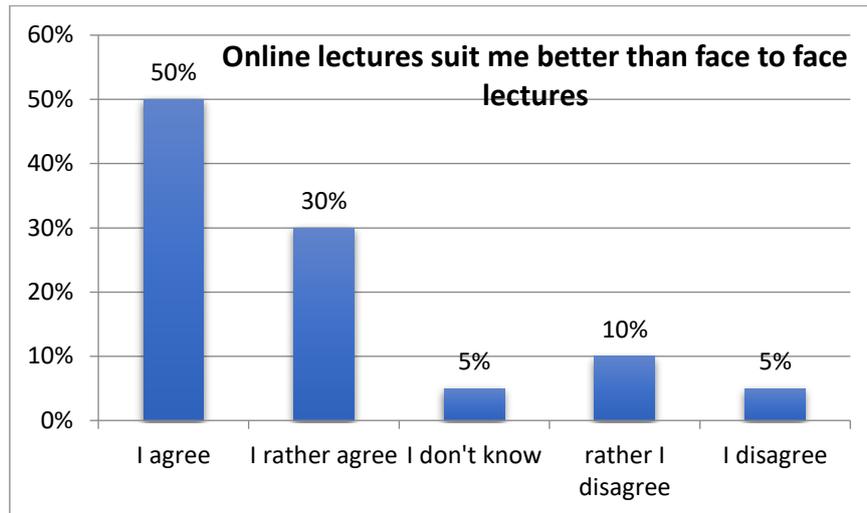
Figure 5: Students' answer to the questionnaire item

We were also surprised by the Business Process Modeling course students' attitude to online exercises. As can be seen from Fig. 6, only 40% of students prefer online exercises compared to face-to-face exercises. Furthermore, 45% of students would prefer face-to-face exercises in teaching. The conclusion cannot yet be generalized due to the low number of respondents. To verify this, we plan further extensive research.

Figure 6: Students' answer to the questionnaire item

4. Conclusions

The presented research revealed two significant findings:

- Although there is a difference in the average values in the perception of individual factors depending on gender, students' whole sample perceives online lectures positively. They prefer

them more than face-to-face lectures, recommend using them in university studies, and recognize that they can use the skills acquired in online lectures later in the job.

- Attitudes towards online exercises are no so highly positive. Online exercises do not suit them more than face-to-face exercises, nor do they find them more useful. However, they strongly agreed with the statement that they would learn more in exercises through MS Teams application than in face-to-face exercises and recommended to use them in further study.

The research confirmed that the form of teaching through digital technologies does not cause any problems for students. However, technology-based teaching significantly reduces costs and streamlines the learning process due to making it available anywhere. [6] We also noted an increase in students' active participation in online lectures compared to face-to-face lectures. The acquired knowledge is fully valid for the environment in which it was acquired. To verify validity in a broader context, it would be necessary to carry out similar research in other universities' environment and with a more extensive set of respondents. However, it can be assumed that students of technical study programs will have a similar acceptance of online education. We obtained the gained results presented in this article to adapt the teaching model, making extensive use of digital technologies.

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