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Military Versus Civilian University Online Education

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Abstract

This paper compares online teaching during the Covid-19 pandemic at a military and civilian university. It is based on three independent questionnaire surveys in which respondents rated the quality, advantages, and disadvantages of online instruction relative to face-to-face instruction and indicated which type of learning they preferred. The data obtained were processed using the descriptive statistics and the cluster analysis. The results show similar perceptions of the pros and cons of online learning at both types of universities. When evaluating online learning, military students showed similarities only to civilian upper-level students and were more accepting of such learning.

KEY WORDS: *military education, online teaching, questionnaire surveys, cluster analysis, descriptive statistics.*

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1. Introduction

With the possibility of internet connectivity and new technologies in computers and their equipment, distance learning is both much discussed and used. During the Covid-19 pandemic, all types of schools including universities had to switch to online education. Some students found it difficult to adapt to this change, while others welcomed the opportunity to learn from home via computer. Some elements of online learning have proven successful and are now being used in hybrid education.

Distance education was already discussed before the pandemic, see for example [11]. Specifically, the works [12], [13] dealt with the analysis of courses taught in a military environment and testing methods applicable in distance and full-time military university courses. Distance learning in the field of advanced military education was addressed in the work [6]. The role of online learning tools and the study of university students' perceptions of online learning during the Covid-19 lockdown were addressed in papers such as [1], [2], [3] and [10]. Similarly, work [9] studied the perceived benefits and challenges of online learning and impact of online classes on student's ability to learn.

Furthermore, studies [8] and [15] compared the evaluation of online and face-to-face teaching by students of economically oriented disciplines. Finally, the research [4] analysed the opportunities and challenges of distance learning based on the experience of education during the Covid-19 pandemic and study [7] compared face-to-face and online military professional instruction during this pandemic.

In this paper we compare three independent questionnaire surveys conducted between 2021 and 2022 at the Faculty of Military Leadership of the University of Defence and the Faculty of Business and Economics of the Mendel University, both in Brno, Czech Republic. The main objective is to assess the contribution of online teaching during the Covid-19 pandemic, to evaluate it subsequently with face-to-face teaching and, above all, to compare the results obtained at the aforementioned military and civilian university.

In the Faculty of Military Leadership, the science subjects Mathematical Methods and the humanities subjects Military History and English Language were chosen for comparison, all taught in the first year of a five-year Master's degree program. The survey was conducted at the end of the second year to allow students to evaluate both types of teaching.

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Only science courses were monitored at the Faculty of Business and Economics, namely three courses of Mathematics in the first year of the Bachelor's degree and the course of Operational Research in the first year of the follow-up Master's degree. The mathematics subjects were assessed by the students at the end of their first year, and Operational Research at the end of their fourth year at the university.

2. Data and Methods

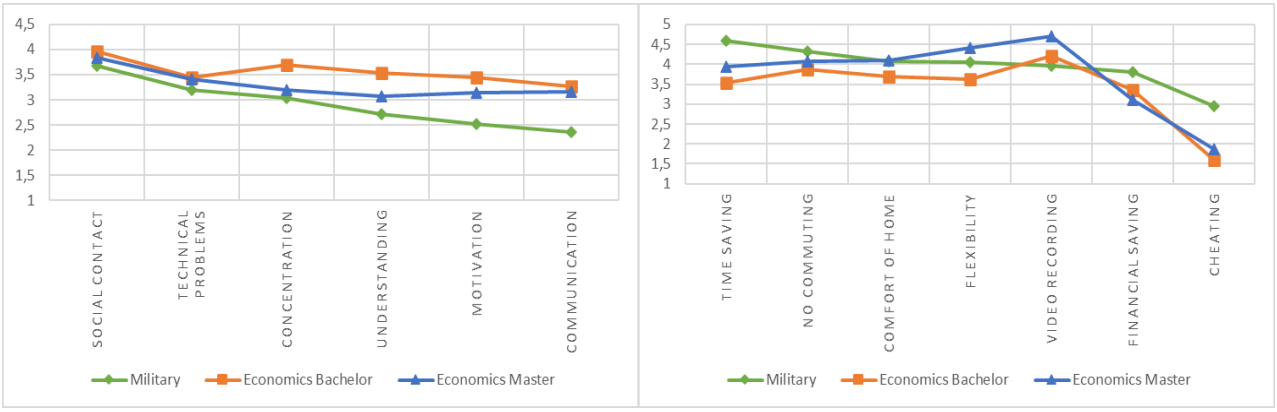
All the questionnaires mentioned above were created in Google Forms for data collection. The number of questions and their content varied from survey to survey. Most questions were closed-ended and used a five-point Likert scale for rating. In all cases, however, respondents rated the quality and satisfaction with online instruction, its advantages and disadvantages and compared it to face-to-face instruction. They were also asked which type of teaching they preferred.

A total of 437 respondents participated in these three surveys, including 100 military and 337 civilian students. The majority of military students were male, whereas the selected civilian field had a more balanced representation of men and women and even in the chosen follow-up civilian Master's degree there was a predominance of women.

Furthermore, data classification was performed using the cluster analysis. This classifies the underlying set of objects, i.e., students, into several relatively homogeneous clusters such that objects within a given cluster are as similar as possible, while objects of different clusters are as dissimilar as possible. The Euclidean distance was used to calculate the distances of the objects. Hierarchical clustering and k-means clustering methods were used to partition objects into clusters, see [5]. A split into two clusters was always used to process the data.

3. Results and discussion

When the disadvantages of online learning were rated on a Likert scale of 1-5 (in Figure 1(a) vertical axis), where 1 indicates no disadvantage, 2 a small disadvantage, 3 a medium disadvantage, 4 a major disadvantage and 5 is a significant disadvantage, all students at both types of universities complained most about the limitation of social contact, which they considered the biggest disadvantage, see in the Figure 1(a). Technical problems were quoted next in order. Civilian bachelor's students reported lower concentration during online learning and poorer understanding of the material discussed in this way and also low motivation in contrast to military and civilian master's students. Military students perceived low motivation and weak communication with teachers as less of a disadvantage than civilian students. This result may be due to the fact that students at the beginning of their university studies are getting used to a new style of learning, where student independent work and self-study predominate.



(a) Disadvantages (b) Benefits

Fig. 1. Average rating of disadvantages and benefits of online learning.

When it comes to rating some of the benefits of online learning, where the numbers 1-5 on the Likert scale mean the following (in Figure 1(b) vertical axis): 1 no advantage, 2 a small advantage, 3 a medium advantage, 4 a major advantage, 5 a significant advantage, the most valued by military students were time saving and not having to commute. The civilian students were most appreciative of the video recordings provided and flexibility, see Figure 1(b). Other benefits included the convenience of home and reduced financial expenses were rated similarly. The possibility of cheating in online exams did not appear to be an advantage to civilian students, it was more appreciated by military students.

If we consider the question of which type of instruction students would prefer, Figure 2 shows the percentage of students in the selected fields. Military students are much more likely to prefer online instruction over face-to-face instruction. On the other hand, civilian students are more evenly split and tend to prefer face-to-face instruction. Similarly, the findings in [14] show that polytechnic students had a slightly higher preference for face-to-face learning.

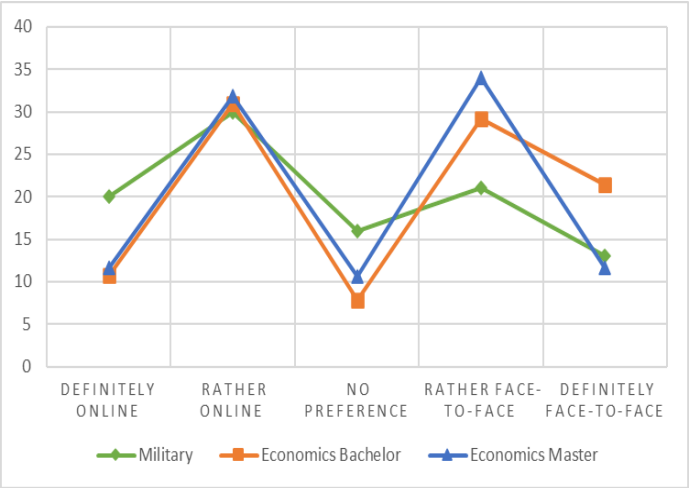


Fig. 2. Preferred type of learning.

From the evaluation of online learning, it is clear that civilian bachelor's students rate online learning worse. Figure 3 shows the percentage of students rating their satisfaction with online learning. Both military and civilian master's students mostly rated the online instruction as rather good, at about 50 percent, while civilian bachelor's students mostly rated it as average and more considered it rather poor.

Fig. 3. Satisfaction with online learning.

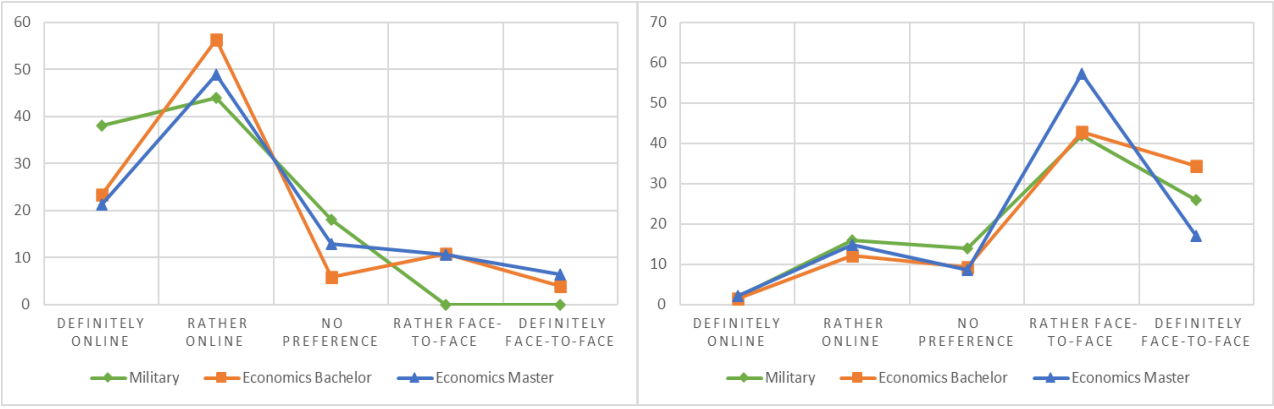
Subsequently, the data were processed using the cluster analysis, where variables for creating clusters were chosen as the selected answers to the questions concerning the advantages and disadvantages of online learning, and the answers to the preferred type of learning. The set was divided into two homogeneous groups in all three surveys. These two clusters were completely identical in terms of number of students in the case of military and civilian master's students. For the civilian bachelor's students, the second cluster was more numerous (57.6%).

The cluster centers are very close when evaluating the advantages of online learning, whereas the cluster centers differ when evaluating the disadvantages, with the cluster 1 centers lying lower than cluster 2 centers. Thus, cluster 2 respondents rate the disadvantages of online learning as more significant. Cluster 1 respondents lean more towards distance learning, while cluster 2 respondents lean towards face-to-face learning.

These two resulting groups could be interpreted as follows, cluster 1 are students who prefer online education, perceive its advantages and are not too bothered by its disadvantages. We will call it the Online Cluster. Cluster 2 represents students who prefer face-to-face learning and feel less the advantages of online learning and are more bothered by its disadvantages. We will refer to this cluster as the Face-to-face Cluster. Both of these clusters are equally numerous, with the exception of a greater representation in the Face-to-face Cluster in the case of civilian bachelor's students.

Let us first look at the percentage of preferences for learning types in each cluster. The Online Cluster, as shown in Figure 4(a), is dominated by students who tend to prefer online learning; there is also a large proportion of military students who definitely prefer this type of learning and that is 38 percent.

In the Face-to-face Cluster, Figure 4(b), there is a preponderance of students who prefer face-to-face instruction, with 34 percent of civilian bachelor's students strongly preferring this type.

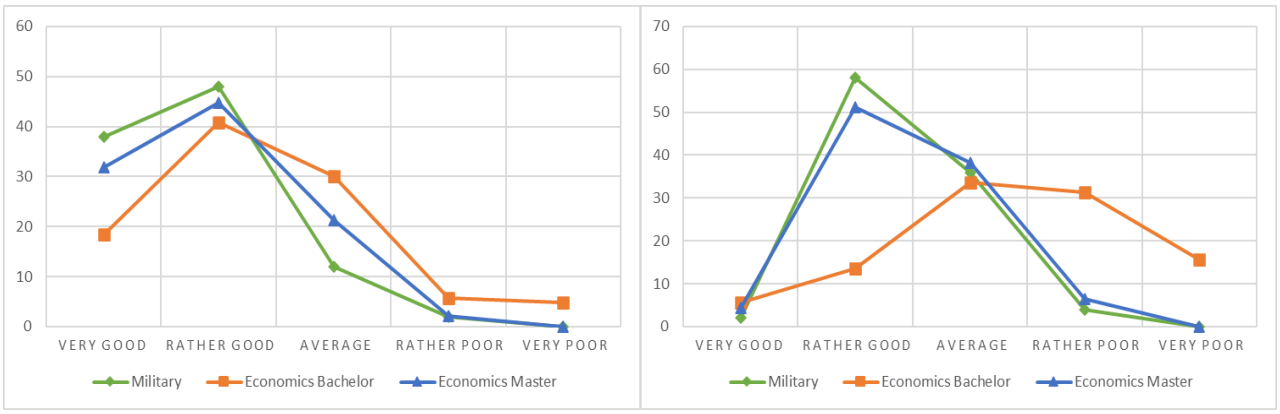


(a) Online Cluster (b) Face-to-face Cluster

Fig. 4. Preference for type of learning in clusters.

Now let us have a look at how online learning was evaluated in each cluster, the data are shown in percentages. The Online Cluster assessed it most as rather good and then very good and student evaluation are similar. The military students rated it the highest, while the civilian bachelor's students rated it the lowest, as can be seen in Figure 5(a).

In the Face-to-face Cluster, for military students and civilian master's students, the predominant rating of online learning is also rather good, and it is over 50 percent, followed by average. However, civilian bachelor's students consider it average to rather poor, and the orange graph shows a shift towards a poor rating. This result is to be expected because the students were surprised by online learning at the beginning of their studies and had not yet formed the necessary habits for studying at university. For this reason, they could rate this type of learning worse.



(a) Online Cluster (b) Face-to-face Cluster

Fig. 5. Satisfaction with online learning in clusters.

4. Conclusions

The observed surveys show that online instruction was accepted by military students as a suitable substitute for face-to-face instruction and was even more preferred by them. Compared to civilian courses, its preference was slightly higher. Satisfaction with online teaching in the military studies was then rated comparably in the civilian follow-up master's course. Although students in the surveys can be divided into two groups of roughly equal size, namely supporters of online learning and supporters of face-to-face learning, both groups show satisfaction with online learning, especially master's students. Therefore, the use of online teaching in higher education can be recommended, also in military studies.

5. Limitations

Online teaching at the military university was compared with only one civilian university, and that of the economics major. The chosen courses were similar in focus but did not cover the full range of courses of the study under review. The aforementioned questionnaire surveys were not identical and differed in some questions.

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