

Please note! This is a self-archived version of the original article.

Huom! Tämä on rinnakkaistalenne.

To cite this Article / Käytä viittauksessa alkuperäistä lähdettä:

Kinnari-Korpela, H. (2021) How do ICT engineering students experience online teaching and learning? Blended Learning in Engineering Education: challenging, enlightening – and lasting? Proceedings of the SEFI 49th Annual Conference SEFI – European Society for Engineering Education, 1427-1433.

URL: <https://www.sefi.be/wp-content/uploads/2021/12/SEFI49th-Proceedings-final.pdf>

HOW DO ICT ENGINEERING STUDENTS EXPERIENCE ONLINE TEACHING AND LEARNING?

H. Kinnari-Korpela

Tampere University of Applied Sciences
Tampere, Finland

Conference Key Areas: *Methods, formats and essential elements for online/blended learning, Social aspects and communication in online/blended learning*

Keywords: *Motivation, students' learning experience*

ABSTRACT

Due to Covid-19 pandemic, universities were forced to quickly shift from on campus operations to online teaching and learning. At Tampere University of Applied Sciences (acronym TAMK) online teaching was implemented with a few days' notice in March 2020. Since then, teaching has been organized mainly online. As online teaching and learning continues, concerns about students have grown.

The aim of this study was to explore TAMK's ICT engineering students' learning experience, academic success, wellbeing and studying motivation during Covid-19 pandemic. An online survey was sent to all ICT Engineering student at TAMK in March 2021. The survey focused on students' experience related to online teaching and learning. For designing the survey questions related to motivation factors, Pintrich et al. [1] Motivated Strategies for Learning Questionnaire (acronym MSLQ) was applied.

A total of 127 ICT engineering students responded to the survey. The results emerged concerns such as two-thirds of respondents experienced that their motivation to study has decreased during the academic year 2020-2021. Additionally, almost 50 % of the respondents experienced that 'I have done a less work with my studies during online teaching and learning than in the past' and 60 % felt that they haven't reached the same expertise during online teaching than they would have reached in face-to-face teaching. However, the respondents were mainly satisfied with the way in which online teaching has been implemented.

1 INTRODUCTION

When the Covid-19 pandemic started in Finland in March 2020, universities were forced to quickly shift from on campus operations to online teaching and learning. At TAMK online teaching was implemented with a few days' notice. University lecturers had a few days to build in their homes online teaching facilities and redesign their courses.

Since March 2020, teaching has been mainly organized online at TAMK. In many cases, there hasn't been time to evaluate the best pedagogical practices but just act and continue with teaching [2,3]. There haven't been time, enough expertise, or sufficient recourses in developing teaching staffs technological and pedagogical online teaching skills.

Before the Covid-19 pandemic, teaching mainly took place in classroom settings at TAMK's ICT engineering department. Many teachers taught traditionally, i.e., classroom sessions included teaching, mentoring, and doing various exercises or laboratory work depending on the course. Practically teaching through Zoom or Teams was not provided and only a few teachers, for example, used short educational videos to support teaching. With the pandemic, both students and university lecturers found themselves in a new situation.

At the time of writing this short paper, the Covid-19 pandemic continues. It is not yet known what the possibility is for organizing face-to-face teaching and what kind of regional restrictions there will be during the autumn 2021. However, it is certain that online learning will be continued to some extent, at least for the third- and fourth-year students. TAMK administration has also outlined that the amount of online learning will increase in the coming years.

As online teaching and learning continues, concerns about students have grown. This study aims to explore TAMK's ICT engineering students' learning experience. The following research questions are addressed:

1. How do ICT Engineering students experience remote learning?
2. What kind of study motivation do students have?
3. How do students experience their academic success?
4. How are the students doing?

2 METHODOLOGY

2.1 Survey

The study was conducted with an online survey during March 2021 and it was targeted to ICT engineering students at TAMK. The head of ICT engineering degree programme sent the link of the electronic survey via email to all ICT engineering degree programme's students.

The survey included both qualitative and quantitative questions. Most of the quantitative statements were constituted using 5-point Likert scale with 'don't know' option (1 = 'fully agree' to 5 = 'fully disagree') or (1 = 'daily', 2 = 'weekly', 3 = 'a few times a month, 4 = 'rarely', 5 = 'not at all'). The survey mainly focused on engineering students' study experience during the pandemic. The survey consisted of items concerning students' learning experience, academic success, wellbeing, and motivation. Pintrich et al. [1] MSLQ was applied for designing statements on motivation. The survey contained also general information such as sex, background

studies, year of studies, working in a job during current academic year and weekly working hours.

2.2 Sample

The study participants were students of ICT engineering degree programme at TAMK. A total of 127 students responded to survey, which means slightly under 40 % response rate. The majority of survey participants was male (77 %) and the minority female (20 %) or other (3 %). Before studies at TAMK, 54 % of participants had studied in high school, 34 % in vocational school and 10 % had double degree (both high school degree and vocational school degree). About one-third of the respondents were 1st year students. Table 1 shows the overall distribution of respondents' studying year.

Table 1. Distribution of respondents year of study

Year of study	Percentage
1 st year	38 %
2 nd year	23 %
3 rd year	16 %
4 th year	19 %
other	4 %

2.3 Analysis

The majority of the collected data is quantitative, and the results of the survey are described with descriptive statistics [4] including modes, medians, summaries of sample and distributions of variable. The used statistical method was chosen based on the data type.

3 RESULTS

This short paper reports the preliminary results of the study and more detailed statistical analysis will be carried out later. However, already at this stage, several concerns have emerged from the results. The results have been categorised based on research questions (see section 1).

3.1 Remote learning and academic success

Students' experience of the suitability of online learning for them varies. As figure 1 shows, at the same time almost half of the respondents agreed that 'online teaching suits me' (47 %, median = 3) and other half felt the opposite (46 %) (1 = 'fully agree' to 5 = 'fully disagree').

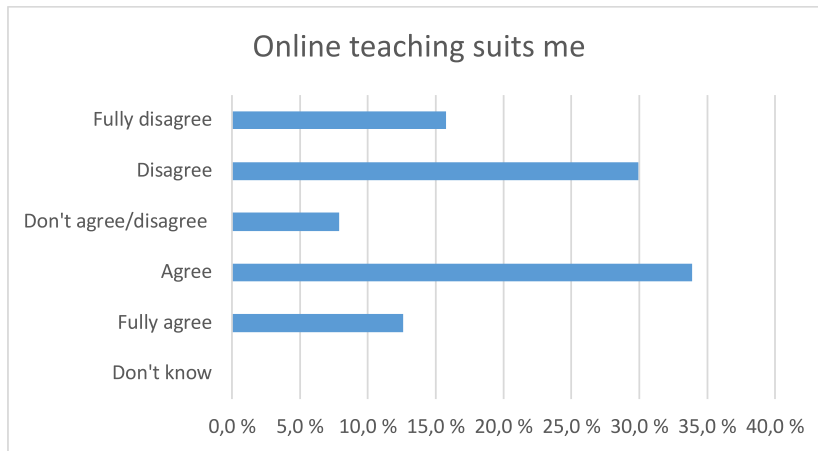


Fig. 1. Suitability of online teaching

Although about half of the respondents experience that online teaching is not suitable for them, only about one-fourth of the respondents reported, that their course grades have dropped during the pandemic. However, about 30 % of the respondents experienced that they would have needed more individual guidance during online learning. Figure 2 shows, how students compared their learning between face-to-face and online teaching.

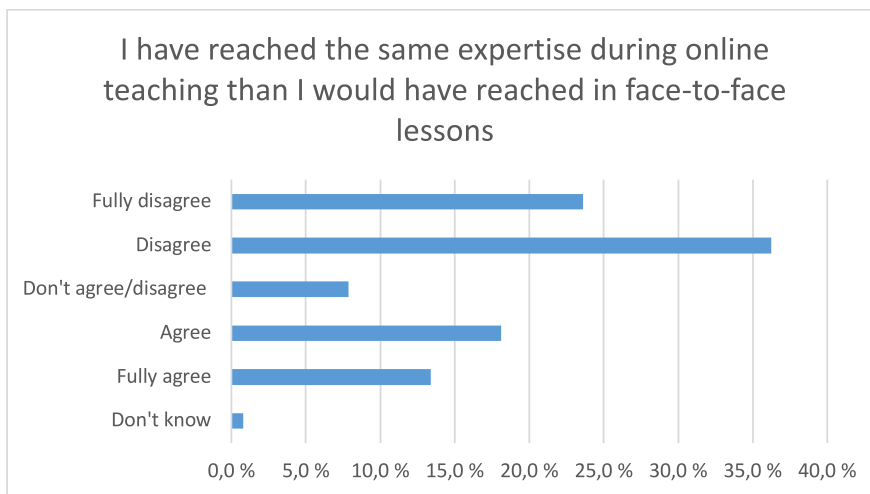


Fig. 2. Students' learning

Almost 60 % of respondents experienced that they hadn't acquired the same expertise during online teaching than they would have reached in face-to-face lessons (statement: 'I have reached the same expertise during online teaching than I would have reached in face-to-face lessons'; mean and mode = 4). The same amount of respondents experienced in general, that 'I don't learn as well in online teaching as I would learn in face-to-face lessons' (mode = 1, median = 2) (see figure

3). These results are inconsistent with the literature [5, 6] but the results may be explained by the fact that the courses at TAMK are not originally designed to be suitable for online learning. [5] explored the online learning instructions designed and implemented for online learning needs using proper pedagogy and technology.

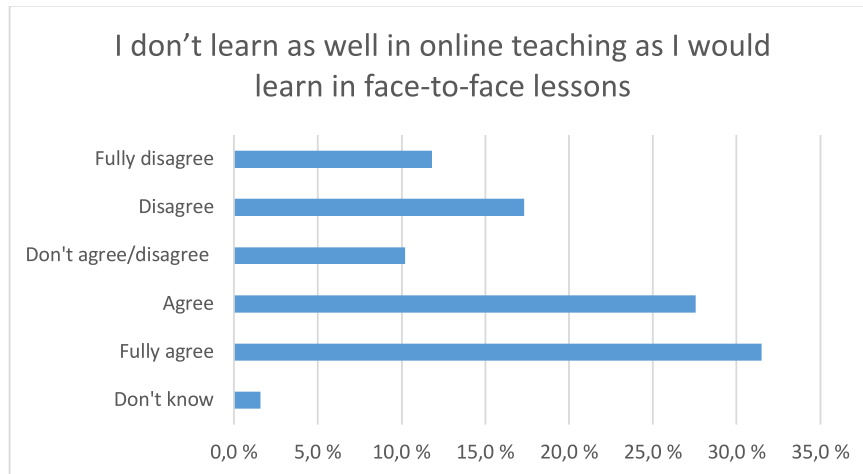


Fig. 3. Online teaching vs. face-to-face lessons

Almost 40 % of the respondents found the workload associated with online learning too great. From the perspective of students learning, these figures are quite significant. Although the students felt learning gap, the respondents were mainly satisfied with the way in which online teaching has been implemented.

Figure 4 shows the distribution of the preferred teaching methods. The respondents preferred the most face-to-face teaching and the combination of face-to-face teaching and real-time online teaching.

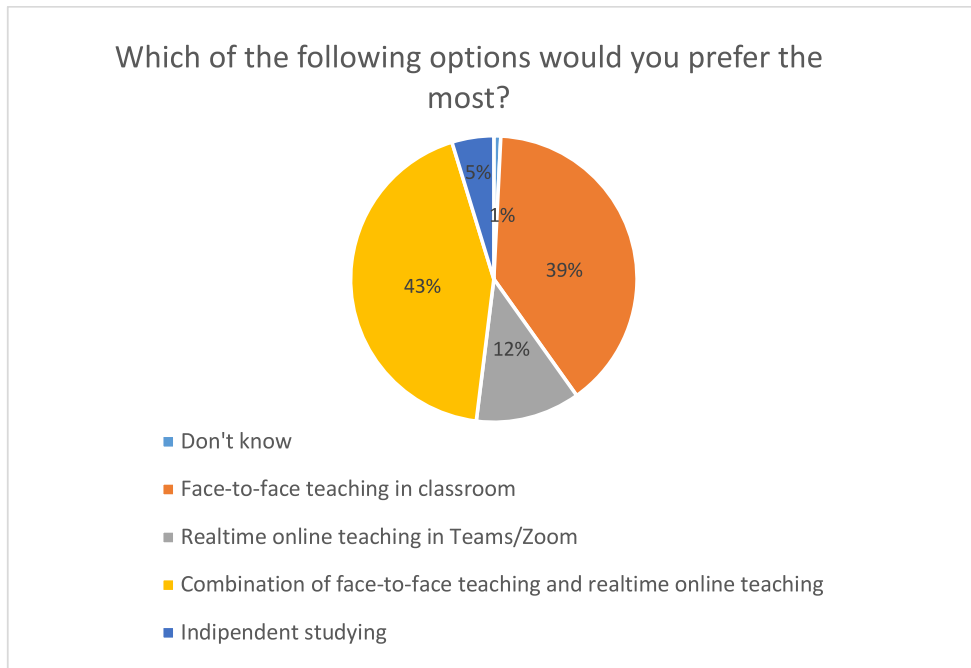


Fig. 4. Preferred teaching methods

3.2 Motivation

Two-thirds of the respondents (see figure 5) experienced that their motivation to study has decreased during the current academic year (mode and median = 2). Furthermore, almost 60 % of the respondents experienced that online teaching has reduced their study motivation (mode and median = 2). These figures are alarmingly high. Additionally, almost 50 % of the respondents experienced that 'I have done a less work with my studies during remote learning than in the past'.

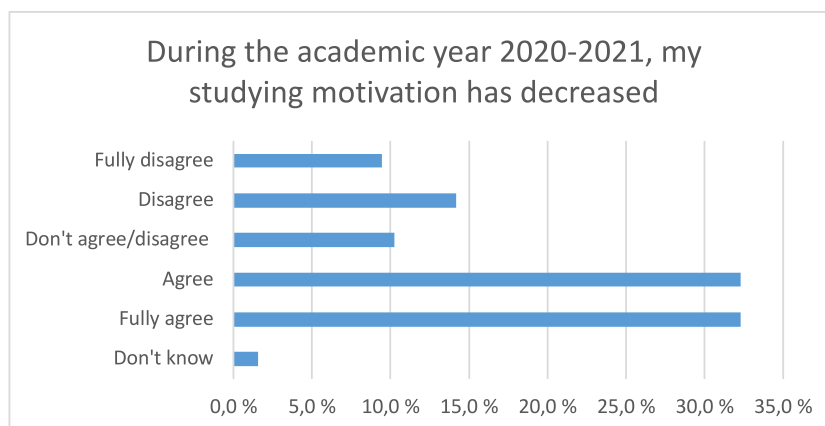


Fig. 5. Studying motivation

As many as half of the respondents feel that they do not make effective use of the time they spend studying. 37% of respondents felt that 'if the course is difficult, I give up or do only the easiest tasks or study only the easiest things'. On the other hand, 95 % of respondents felt that 'a nice teacher would increase my desire to learn'. This result is consistent with the literature [7].

3.3 Well-being

According to the responses, about one-third of the respondents feel themselves depressed and over 40 % of the respondents experience daily or weekly anxiety. These are quite high figures. One-fifth of the respondents reported they have utilized health care services to alleviate the anxiety caused by the Covid-19 pandemic. In addition, 57 % of the respondents have experienced challenges in the normal rhythm of their everyday life (e.g. she/he is awake later than usual or sleeps longer than before).

4 SUMMARY

The results emerged many concerns related to online learning. Based on the results, the biggest concerns are students' lowering study motivation, learning gaps, and well-being challenges. This study provides a good starting point for developing these issues during academic year 2021-2022.

REFERENCES

- [1] Pintrich, P. R., Smith, D. A. F., Garcia, T., & McKeachie, W. J. (1993). Reliability and predictive validity of the motivated strategies for learning questionnaire (MLSQ). *Educational and Psychological Measurement*, 53, 801-813.
- [2] Jandrić, P. (2020). Postdigital research in the time of Covid-19. *Postdigital Science and Education*, 1-6.
- [3] Teräs, M., Suoranta, J., Teräs, H., & Curcher, M. (2020). Post-Covid-19 education and education technology 'solutionism': A seller's market. *Postdigital Science and Education*, 2(3), 863-878.
- [4] Boone, H. N., & Boone, D. A. (2012). Analyzing likert data. *Journal of extension*, 50(2), 1-5.
- [5] Siemens, G., Gašević, D. & Dawson, S. (2015). Preparing for the Digital University: a review of the history and current state of distance, blended, and online learning. Arlington: Link Research Lab.
- [6] Batdı, V., Doğan, Y., & Talan, T. (2021). Effectiveness of online learning: a multi-complementary approach research with responses from the COVID-19 pandemic period. *Interactive Learning Environments*, 1-34.
- [7] Kinnari-Korpela, H. (2019). Enhancing Learning in Engineering Mathematics Education: Utilising Educational Technology and Promoting Active Learning. (Tampere University Dissertations; Vol. 38). Tampere University.