

**Polona Gradišek and Alenka Polak**

# Insights into learning and examination experience of higher education students during the Covid-19 pandemic

**Abstract:** The study process in higher education in Slovenia and worldwide was strongly affected by the Covid-19 pandemic, which began in the second semester of the 2019/2020 academic year. There was a sudden shift from face-to-face teaching and learning to virtual teaching and learning; this shift was facilitated by various digital platforms such as Moodle, Zoom and MS Teams and exam applications such as Exam.net. The process of student integration was affected, including formal and informal student interactions with peers, formal and informal teacher–student interactions and students' psychological needs of relatedness, competence and autonomy. In a sample of 110 students of the first year of different study programmes at the University of Ljubljana, Faculty of Education, we investigated how specific study methods and tasks contributed to the students' competence development and how demanding they were for the students during the Covid-19 pandemic. We also analysed the students' perceptions of the online exam process. The results showed a positive contribution of the chosen adapted teaching and learning methods and tasks to the students' competence development and that the students successfully mastered the new skills related to online exams. Furthermore, various study difficulties and examination challenges were mentioned and analysed. Although online teaching and learning is successful, it cannot replace the face-to-face experience, especially in pedagogical faculties where university teachers are important role models for future teachers.

**Keywords:** Covid-19 pandemic, higher education, teaching, learning, assessment, online learning

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*Polona Gradišek, PhD., teaching assistant, University of Ljubljana, Faculty of Education, Department of Education Studies, Kardeljeva ploščad 16, SI-1000 Ljubljana, Slovenia;  
e-mail: polona.gradisek@pef.uni-lj.si*

*Alenka Polak, PhD., assistant professor, University of Ljubljana, Faculty of Education, Department of Education Studies, Kardeljeva ploščad 16, SI-1000 Ljubljana, Slovenia; e-mail: alenka.polak@pef.uni-lj.si*

## Introduction

The Covid-19 pandemic has severely affected all aspects of our lives, from our health, the economy, education and our private lives. The education sector in Slovenia has faced several huge challenges since mid-March 2020, when the pandemic reached its height and all educational institutions, from kindergartens to universities, were closed. Higher education switched from face-to-face communication between teachers and students to virtual communication. Both teachers and students were unprepared for such a change in the educational process. University management, administration, teaching staff and ICT support staff had to find practical solutions to continue the second semester of the 2019/2020 academic year and provide students with adequate opportunities to complete it successfully.

When teachers had to move from face-to-face to online teaching, they had to plan distance learning, rationalise and adapt their course content, prepare teaching materials (text, video, audio) and find creative solutions for distance knowledge assessment. During this transition to online teaching, the traditional role of teachers was redefined, and teachers faced various challenges. Instead of giving face-to-face explanations, teachers organised online lectures (prerecorded or live) and sent notes, papers and book chapters to their students via different platforms (e.g., Moodle) or communication channels (e.g., e-mail). Overnight, they had to learn new skills related to group communication software (e.g., Zoom, Microsoft Teams, Exam.net). They also had to rethink their examination process, for example, by using assessment platforms such as Exam.net, Moodle, Internet survey applications and so forth. Before the pandemic, many teachers used these applications more or less frequently, but since the switch to online teaching and learning, these applications have become the only channel of communication between teachers and students. Moreover, there was a shift from a teacher-controlled environment to a more learner-controlled environment. The role of the educator has become more of a facilitator role, requiring minimal scaffolding (Geng et al. 2019).

The students, on the other hand, experienced greater interruptions in their study process and individual learning. They were suddenly »locked out« of universities, libraries and student residences, many of them having to move back to their

parents' homes, with some of them facing financial problems because many student jobs were cancelled. The students had to deal with the organisational changes of the study processes; they had to acquire new ICT skills, for example, how to install and use communication applications such as Zoom, Microsoft Teams and Exam.net. The students also had to deal with some psychological problems because there were numerous uncertainties that might have increased the students' anxiety and fear regarding their health.

### *Students' competence development during the Covid-19 pandemic*

To gain insight into the learning and assessment processes of Slovenian students during the Covid-19 pandemic, it is necessary to critically reflect on the process of developing students' competences during this specific period. Over the last two decades, several discussions on teaching approaches in higher education institutions have taken place in Slovenia and abroad. The need to improve students' »active learning« has always been at the centre of these discussions, especially in the field of teacher training (Marentič Požarnik 2001; Bluma and Kiefer 2005). Competence analyses regarding what is needed for future teachers have emphasised the importance of ICT skills (Tancig 2006; Peklaj 2010). During the Covid-19 pandemic, the everyday use of ICT has become the centre of students' and teachers' professional and personal lives. Therefore, »what we anticipated to attain in the next few years, has been made possible in three months« (Mohapatra 2020, p. 5). However, it is highly unlikely that in this extremely stressful learning context, all students and teachers have fully developed their ICT competences.

Up until the Covid-19 pandemic, teachers could recognise students' use of technological devices during the learning process as a disruptive factor (e.g., messaging on mobile phones or surfing the Internet instead of following the lecture). With the pandemic, the perception of technical devices during the learning process has changed greatly. Different ICT channels (e-mail, Skype, Microsoft Teams, Zoom, etc.) have become crucial; they have even become the (almost?) only possible link between teachers and students, creating a link between the virtual teaching process and the inner learning process of the individual. For successful online education, both teachers' and students' perceptions of ICT in education are important: teachers are the main actors in the successful implementation of ICT-integrated learning, while students' perceptions and attitudes have a direct impact on their learning and motivation (Ali 2020). As far as students are concerned, most are well skilled in the use of technology; today's generations of students have been called the »digital generation« (Ali 2018). During the Covid-19 pandemic, the need to integrate technology into education has become more apparent.

In 2008, the Tuning Project (Tuning Educational Structures in Europe 2008) identified a list of generic competences needed for »Bologna« student teachers to become competent teachers of the twenty-first century. During the distance learning process that began because of the Covid-19 pandemic, interpersonal competences, such as the individual's ability to express his or her own feelings, critical and

self-critical abilities, and social skills related to interpersonal skills or teamwork (Tuning 2008), could not be developed in the same way as during live teaching. Namely, the interaction between teachers and students is crucial for the development of positive self-esteem, self-confidence and identity, as well as for improving students' group work skills (Di Pietro et al. 2020).

During the pandemic, using ICT has become the leading competence for enabling and developing all other generic and subject-specific competences of future teachers. ICT skills suddenly became crucial for the systematic improvement of thinking skills, critical and self-critical competences, literature searches and in-depth study of literature (Tuning 2008). Two trends listed in the conclusions of the Tuning Project were spontaneously achieved during the Covid-19 pandemic: (1) the increase in evidence-based (student learning) practice and (2) the growing trend to offer online elements of programmes and the use of Internet resources as part of teaching and learning strategies.

### *Psychological needs and social integration of students during the Covid-19 pandemic*

Mohamedhosein and Crul (2018) explain college students' learning and success in relation to two concepts: (1) the concept of psychological needs based on the theory of self-determination (SDT) (Ryan and Deci 2017) and (2) the concept of social and academic integration by Tinto (1993). From an SDT perspective (Ryan and Deci 2017), students' learning and development is linked to the support of basic psychological needs of relatedness, autonomy and competence. Here, relatedness refers to warm, supportive and friendly relationships in which students experience openness and trust. Autonomy means that students feel that their choices and views are important; therefore, they perceive their learning more personally and meaningfully and are more intrinsically motivated. Competence is important for students' efficacy and the development of students' skills; teacher feedback is crucial when students face challenges. When these needs are met, students can flourish and experience quality learning, become cognitively engaged, make an effort to learn and become more persistent. Regarding the concept of social and academic integration, Tinto (1993) emphasises the importance of a successful integration of first-year students into a new social and intellectual life. When students find their interactions meaningful and rewarding, they increase their learning efforts. Mohamedhosein and Crul (2018) combine these two concepts in a model in which student integration and basic psychological needs lead to academic success (see Figure 1).

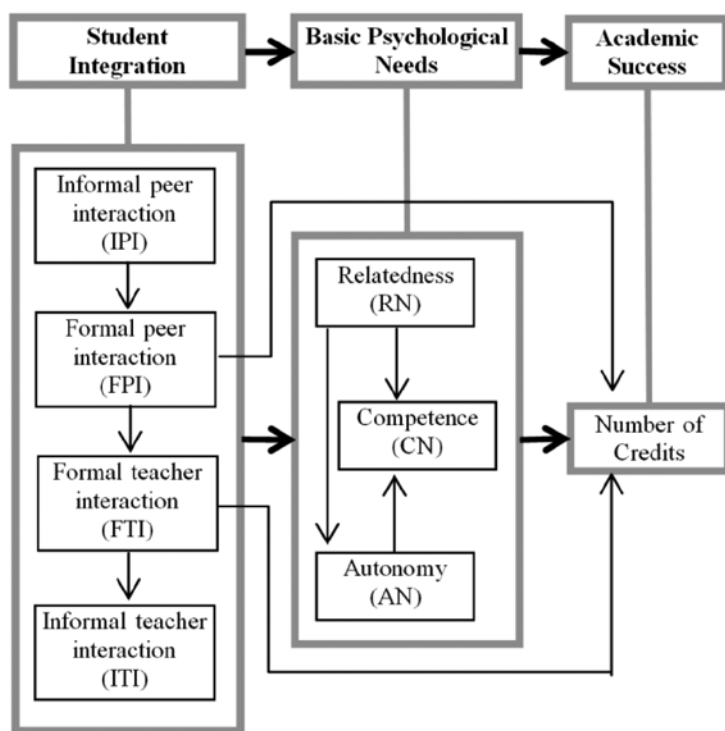


Figure 1: The hypothesised model of Mohamedhosein and Crul (2018, p. 1704).

During the Covid-19 pandemic, all components of the model shown in Figure 1 were affected, which is why we have used this model as a basis for analysing students' experiences during this period. When the learning process suddenly switched to online education, the psychological needs of the students and their social and academic integration were enormously challenged. For first-year students, *social integration* is often more important than academic integration because peer support helps students overcome difficulties at the beginning of their studies (Mohamedhosein and Crul 2018). Because of the lockdown, students' face-to-face contact with peers has been reduced or cancelled, affecting the *need for relatedness*. The students' *need for autonomy* changed as well. On the one hand, students had more autonomy in organising their time, but on the other hand, there was so much unfamiliarity regarding their study process that they may have felt less autonomous. The *need for competence* was affected – students faced many challenges regarding their study process, so they might have questioned their ability to master all the requirements in their changed forms. Also, teacher feedback, which is an important source of students' perceived competency and that affects students' learning success, was only possible through ICT. Therefore, it was probably not as authentic and holistic (e.g., integrating verbal and nonverbal communication) as it would have been otherwise. In addition, teachers differ in their competences of giving quality feedback through

ICT, and students differently perceive and interpret such received feedback. *Social interactions* with peers and teachers shifted to online platforms and were not of the same quality as before the lockdown. All these factors may have influenced the students' academic performance during this specific period of study.

### *Knowledge assessment and examinations*

Knowledge assessment is a very important part of the study process. The Tuning Project (2008, p. 76) strongly recommends investing 'in the development and sharing of a wide range of new revised assessment techniques to match the increased variations in approaches to teaching and learning in higher education'. This has become very relevant and necessary during the Covid-19 pandemic. It was a challenge to find ways to organise examinations and ensure that students had the opportunity to progress in their studies (OECD Education Policy Perspective 2020). Several important issues have been raised, such as how to ensure that students take their exams alone and without assistance; how to assess students' skills in practical areas; and how to design distance exams that reliably certify students' progress and add value to their learning (OECD Education Policy Perspective 2020). Some exam-related challenges have arisen during the pandemic, such as the possible increase in unfair student behaviour, the need to ensure objective assessment for all students and the risk of technical failure during online exams.

### *The authors' experience and insights*

During the Covid-19 pandemic lockdown period, online teaching was also a challenging professional experience for the authors of the current paper. We taught several study courses at the University of Ljubljana, Faculty of Education. Our role as teachers changed, and sometimes, our feelings of self-efficacy were tested. Apart from the professional efforts to adapt and reorganise the study process to ensure that students continued to learn, we also dealt with our own fears and uncertainties about the health and well-being of ourselves and our family members.

Teacher self-efficacy, which reflects teachers' perceptions of their teaching and classroom management skills, is crucial because of its influence on students' motivation and performance and on teachers' engagement, commitment and job satisfaction (Schleicher 2019). According to TALIS research (OECD 2014), teachers' self-efficacy was best demonstrated by preparing 'good' questions for students, using different assessment techniques, adjusting explanations and using alternative teaching strategies. All these were important educational challenges during the pandemic. Teachers had to ask complex exam questions to achieve higher cognitive levels, grades were compiled from different learning tasks, students were offered additional explanations and materials and new, alternative teaching methods had to be used.

As university teachers, we noticed a strong shift from organising interactive lectures to enhancing the individual self-directed learning of students.

In contrast to the experiences of the last few years, when students were very reluctant to engage in individual learning (e.g., reading literature), this form of study has suddenly become dominant. On the other hand, real face-to-face interactions were missing, so it was almost impossible to develop the important socially oriented competences of the students. We emphasised the systematic development of in-depth critical, professional written reflection of the students and the integration of theoretical knowledge to solve hypothetical situations in practice.

When the exams were shifted to online platforms (the authors of the present paper used the Exam.net application), there was a need to restructure the exam questions to ensure that the exams were taken by the students themselves and without assistance. Our exam questions enabled students to find practical implications and creative solutions to hypothetical problems (case studies) in the exam using higher taxonomical levels of knowledge. This was emphasised during the online lectures before the exam because required and desired forms of knowledge were learning with deep understanding and the application of certain theoretical principles into practice (as opposed to pure memorisation of facts without understanding). The final grades were composed of several individual critical written reflections and the results of the written exam.

### *Aim of the study*

The aim of the current study was to examine how students perceived online learning and online exams during the Covid-19 pandemic. First, we focused on the selected study methods (e.g., online lectures, online tutorials, online seminars, individual study, etc.) and tasks (e.g., writing in-depth reflections as a part of portfolio, filling in the questionnaires) that were relevant in the courses *educational psychology* and *developmental and educational psychology*, which are taught by the authors of the current paper. Next, we examined students' experiences of online exams (the level of perceived stress compared with paper-pencil exams taken at the university and some selected factors related to online exams).

## **Method**

### *Participants*

The participants of the current study were 110 first-year students of various study programmes at the University of Ljubljana, Faculty of Education: preschool education ( $N = 46$ ), social pedagogy ( $N = 28$ ), special and rehabilitation pedagogy ( $N = 27$ ) and speech and language therapy and surdopedagogy ( $N = 9$ ). There was only one male student in the sample. The average age of the participants was 20.1 years. There were 82 full-time students and 28 part-time students in the sample;

they were enrolled in the courses educational psychology ( $N = 75$ ) and developmental and educational psychology ( $N = 35$ ), which were taught by the authors of the present paper.

### *Instruments*

A questionnaire was developed for the study. The questionnaire consisted of two parts, as follows:

- Students' experiences with the study methods and tasks: The students were asked to assess how the selected study methods and tasks (a) contributed to the development of their study competences and (b) how demanding these study methods and tasks were for them. There were 11 items that were assessed on a 5-point Likert scale: (a) from '1 – no contribution' to '5 – strong contribution' and (b) from '1 – not demanding' to '5 – very demanding'. There was also the option 'not applicable'. (c) There was an open question that asked about the challenges and problems during distance learning. All items were analysed separately (not in a scale).
- The students' experiences with online exams: (a) Students assessed the level of stress when taking online exams compared with common exam situations. (b) Students assessed some selected exam-related factors that could contribute to positive or negative results (e.g., wearing comfortable clothes during the exam). (c) Students were asked to assess their level of concern about selected exam-related technical issues (e.g., Internet connection, microphone and webcam). There was a 5-point Likert scale: (a) from '1 – much lower stress level than usual' to '5 – much higher stress level than usual', (b) from '1 – very negative' to '5 – very positive' and (c) from '1 – not worried' to '5 – very worried'. (d) An open question was asked about students' experiences of taking online exams. All items were analysed separately (not on a scale).

### *Procedure*

Students enrolled in the academic year 2019/2020 in the courses educational psychology (preschool education and social pedagogy study programmes) and developmental and educational psychology (special and rehabilitation pedagogy and speech and language therapy and surdopedagogy study programmes) were invited by the lecturers (the authors of the current paper) to participate in the study. They filled in an online survey about their studies during the Covid-19 pandemic. The data were collected at the end of June and beginning of July 2020. Participation was voluntary and not anonymous because the students identified themselves with their student ID number. The questionnaire was part of the evaluation process of the courses at the end of the semester.



### *Data analysis*

Data were analysed using the statistical programme IBM Statistics SPSS 22. Nonparametric tests were used for testing statistical differences because the distribution of the data was not normal and the samples were relatively small. We used the Mann–Whitney test for comparing two samples (full-time vs. part-time students) and the Kruskal–Wallis test for comparing students in different study programmes.

## **Results and Discussion**

### *Students' experiences with study methods and tasks*

First, the students were asked to assess the extent to which certain study methods and tasks that took place in the form of distance learning because of the pandemic had contributed to the development of their study competences. Table 1 shows their responses.

Students reported that *online lectures* contributed the most to the development of their study competences ( $M = 3.99$ ). About one-fifth of the participants reported that they did not participate in online lectures (all of them were part-time students who took the educational psychology course in winter 2020 before the Covid-19 lockdown and in a live format). It seems that the students preferred an oral explanation of the course content and personal contact with their university teachers, even if only virtually. Moreover, the participants were first-year students who were still mostly familiar with the »ex cathedra« teaching method from high school. Also, it is possible that attending the online lectures helped the students satisfy the need for relatedness with both teachers and students (Ryan and Deci 2017). They were physically separated from each other, but at the same time, they were remotely connected through the online lecture. This may have enabled a feeling of student integration because there was an ongoing formal interaction between teachers and students during the discussion and also a formal interaction with their peers (Mohamedhosein and Crul 2018).

A high percentage of the students did *individual research* for their seminar projects and found this task useful for their study competences ( $M = 3.67$ ). *Online tutorials, online seminars and presentations of seminar projects* followed regarding the perceived contribution of the competence development ( $M = 3.56$ ,  $M = 3.55$  and  $M = 3.51$ , respectively). The proportion of students who did not attend online tutorials and seminars was quite high (36.4%, 31.8% and 29.1%); most of these students were part-time students who completed and presented their seminar projects before the pandemic (modular study programme).

| Responses                                |                 |                   |                       |                     |                          |                |                |      |      |
|------------------------------------------|-----------------|-------------------|-----------------------|---------------------|--------------------------|----------------|----------------|------|------|
| Study methods/tasks                      | No contribution | Weak contribution | Moderate contribution | Strong contribution | Very strong contribution | Not applicable | N (applicable) | M    | SD   |
| Online lectures                          | 0 (0.0%)        | 6 (5.5%)          | 21 (19.1%)            | 28 (25.5%)          | 32 (29.1%)               | 23 (20.9%)     | 87             | 3.99 | 0.95 |
| Individual research for seminar projects | 0 (0.0%)        | 13 (11.8%)        | 25 (22.7%)            | 35 (31.8%)          | 20 (18.2%)               | 17 (15.5%)     | 93             | 3.67 | 0.97 |
| Online tutorials                         | 2 (1.8%)        | 13 (11.8%)        | 16 (14.5%)            | 22 (20.0%)          | 17 (15.5%)               | 40 (36.4%)     | 70             | 3.56 | 1.14 |
| Online seminars                          | 2 (1.8%)        | 12 (10.9%)        | 22 (20.0%)            | 21 (19.1%)          | 18 (16.4%)               | 35 (31.8%)     | 75             | 3.55 | 1.11 |
| Online presentations of seminar projects | 4 (3.6%)        | 11 (10.0%)        | 21 (19.1%)            | 25 (22.7%)          | 17 (15.5%)               | 32 (29.1%)     | 78             | 3.51 | 1.14 |
| Individual literature study              | 0 (0.0%)        | 20 (18.2%)        | 37 (33.6%)            | 32 (29.1%)          | 16 (14.5%)               | 5 (4.5%)       | 105            | 3.42 | 0.97 |
| Individual task within team work         | 5 (4.5%)        | 18 (16.4%)        | 23 (20.9%)            | 27 (24.5%)          | 16 (14.5%)               | 21 (19.1%)     | 89             | 3.35 | 1.16 |
| Teacher-student communication            | 3 (2.7%)        | 21 (19.1%)        | 20 (18.2%)            | 24 (21.8%)          | 15 (13.6%)               | 27 (24.5%)     | 83             | 3.33 | 1.15 |
| Online discussion                        | 3 (2.7%)        | 13 (11.8%)        | 34 (30.9%)            | 17 (15.5%)          | 10 (9.1%)                | 33 (30.0%)     | 77             | 3.23 | 1.01 |
| Filling in the questionnaires            | 3 (2.7%)        | 22 (20.0%)        | 29 (26.4%)            | 22 (20.0%)          | 13 (11.8%)               | 21 (19.1%)     | 89             | 3.22 | 1.08 |
| Portfolio                                | 2 (1.8%)        | 14 (12.7%)        | 13 (11.8%)            | 12 (10.9%)          | 4 (3.6%)                 | 65 (59.1%)     | 45             | 3.04 | 1.07 |

Table 1: Students' responses regarding the contribution of the selected study methods and tasks to the development of their competences during the pandemic

The majority of the students *individually studied* the required course literature ( $N = 105$ ), and 43.6% of the students recognised a strong or very strong contribution of individual literature study to the development of their professional competences. However, one-third (33.6%) of the students recognised only a moderate contribution. Considering the circumstances, we expected that the students would place a greater emphasis on individual studying of the course literature or would recognise its importance to a greater extent. However, according to previous personal observations of the authors of present paper, first-year students are not very familiar with the extended individual study of literature. Less than half of the participating students were preparing *portfolios* ( $N = 45$ ), which was assessed as the smallest contribution to the development of study competences ( $M = 3.04$ ). In our courses, portfolios were not assessed as a whole, but only some of their contents—reflections—were assessed.

The lockdown and closure of universities contributed to more frequent e-mail *communication between students and teachers*. There were no official office hours, so teachers had virtually all their time available for their students. This enabled students to establish formal teacher–student interactions and also satisfied the need for relatedness (Ryan and Deci 2017). About one-third of students (35.4%) recognised a strong or very strong contribution of e-communication between teachers and students to the development of their competences, but 24.5% of students did not communicate with their teachers during this period. It appears that those students who recognised the need for contact with teachers found such communication useful.

The *online discussion* was not perceived as a major contribution to the development of students' competences. In our opinion, an online discussion cannot replace face-to-face discussions in a lecture hall. During the online lectures, only a few students were involved in the discussion, and they felt very insecure at the beginning. We also recognised some characteristics of the communication software (Zoom and MS Teams) as a problem when it came to the online discussion: students could not enter the communication very spontaneously at the moment when they recognised the need for commenting but could enter the communication only one after the other. This caused several uncomfortable moments where students had to determine the order of the discussants, so an important part of the communication was focused on communication regulation and not on the content of the discussion. The integrated feeling of group dynamics was sometimes missing in the online discussion. In addition, first-year students may have lacked the assertiveness to participate in the discussions more.

During our courses, the students were regularly filling in the *self-assessment questionnaires* to reflect on themselves—on their personality, communication patterns, conflict solving processes, learning preferences and so forth. More than half of the students (31.8%) recognised a moderate, strong or very strong contribution of these instruments to the development of their competences.

There were no significant statistical differences between full-time and part-time students regarding the perceived contribution of analysed study methods and tasks to the development of their competences. However, we found some significant differences regarding the students' study programme; they differed in the perceived contribution of the individual literature study, online tutorials and filling in the

questionnaires. The results are shown in Table 2, where only significant differences are presented.

| Study methods/<br>tasks       | Study programme                               | Kruskal-Wallis test |                  |                   |           |          |
|-------------------------------|-----------------------------------------------|---------------------|------------------|-------------------|-----------|----------|
|                               |                                               | <i>N</i>            | <i>Mean Rank</i> | <i>Chi-square</i> | <i>df</i> | <i>p</i> |
| Individual literature study   | Speech and language therapy and surdopedagogy | 9                   | 55.78            | 16.27             | 3         | .001     |
|                               | Preschool education                           | 22                  | 49.86            |                   |           |          |
|                               | Special and rehabilitation pedagogy           | 26                  | 36.12            |                   |           |          |
|                               | Social pedagogy                               | 22                  | 28.27            |                   |           |          |
| Online tutorials              | Speech and language therapy and surdopedagogy | 9                   | 43.72            | 27.25             | 3         | .000     |
|                               | Preschool education                           | 17                  | 42.85            |                   |           |          |
|                               | Special and rehabilitation pedagogy           | 25                  | 36.18            |                   |           |          |
|                               | Social pedagogy                               | 15                  | 12.30            |                   |           |          |
| Filling in the questionnaires | Preschool education                           | 22                  | 50.95            | 17.17             | 3         | .000     |
|                               | Speech and language therapy and surdopedagogy | 7                   | 48.21            |                   |           |          |
|                               | Special and rehabilitation pedagogy           | 27                  | 37.93            |                   |           |          |
|                               | Social pedagogy                               | 21                  | 24.79            |                   |           |          |

*Table 2: Differences between the perceived contribution of the selected study methods and tasks between students of different study programmes (only significant differences are presented)*

*Note: Students who selected the option 'not applicable' were not included in this analysis.*

Students of the study programme speech and language therapy and surdopedagogy perceived the highest contribution as coming from the individual literature study and online tutorials. These students are, in general, very motivated and were very successful learners in high school. On the other hand, students of the social pedagogy study programme perceived the lowest contribution as coming from all three study methods/tasks, as mentioned in Table 2. This can be because of the fact that the social pedagogy study programme is strongly oriented towards emphasising peer interaction and group work as a desirable learning context, so we assume that students' personal motivation for individual work was lower. Individual literature study is a study method that usually takes place the most intensively during an exam period; however, it suddenly became a prevalent study method during distance learning to process. It is interesting that the students of different study programmes perceived its contribution differently. In general, there were more similarities than differences between the students of different study programmes.

Every learning situation places special demands on students. During the Covid-19 pandemic, some learning situations may have been perceived as more demanding than usual, so we were interested in how the students perceived the demandingness of certain learning methods and tasks (Table 3).

| Responses                                |               |                  |                      |                 |                |                |                |      |      |
|------------------------------------------|---------------|------------------|----------------------|-----------------|----------------|----------------|----------------|------|------|
| Study methods/tasks                      | Not demanding | Little demanding | Moderately demanding | Quite demanding | Very demanding | Not applicable | N (applicable) | M    | SD   |
| Individual literature study              | 0 (0%)        | 14 (12.7%)       | 35 (31.8%)           | 42 (38.2%)      | 17 (15.5%)     | 2 (1.8%)       | 108            | 3.57 | 0.91 |
| Individual research for seminar project  | 4 (3.6%)      | 15 (13.6%)       | 39 (35.5%)           | 28 (25.5%)      | 2 (1.8%)       | 22 (20.0%)     | 88             | 3.10 | 0.87 |
| Online presentations of seminar projects | 10 (9.1%)     | 18 (16.4%)       | 30 (27.3%)           | 13 (11.8%)      | 5 (4.5%)       | 34 (30.9%)     | 76             | 2.80 | 1.08 |
| Individual task within team work         | 12 (10.9%)    | 22 (20.0%)       | 30 (27.3%)           | 15 (13.6%)      | 6(5.5%)        | 25 (22.7%)     | 85             | 2.78 | 1.12 |
| Portfolio preparation                    | 9 (8.2%)      | 13 (11.8%)       | 15 (13.6%)           | 3 (2.7%)        | 4 (3.6%)       | 66 (60%)       | 44             | 2.55 | 1.17 |
| Online discussion                        | 17 (15.5%)    | 23 (20.9%)       | 18 (16.4%)           | 14 (12.7%)      | 3 (2.7%)       | 35 (31.8%)     | 75             | 2.51 | 1.16 |
| Online seminars                          | 12 (10.9%)    | 28 (25.5%)       | 26 (23.6%)           | 5 (4.5%)        | 2 (1.8%)       | 37 (33.6%)     | 73             | 2.41 | 0.94 |
| Online lectures                          | 23 (20.9%)    | 26 (23.6%)       | 28 (25.5%)           | 10 (9.1%)       | 1 (0.9%)       | 22 (20%)       | 88             | 2.32 | 1.02 |
| Online tutorials                         | 25 (22.7%)    | 24 (21.8%)       | 18 (16.4%)           | 6 (5.5%)        | 1 (0.9%)       | 36 (32.7%)     | 74             | 2.11 | 1.01 |
| Filling in of the questionnaires         | 37 (33.6%)    | 20 (18.2%)       | 18 (16.4%)           | 10 (9.1%)       | 1 (0.9%)       | 24 (21.8%)     | 86             | 2.05 | 1.11 |
| Teacher–student communication            | 40 (36.4%)    | 25 (22.7%)       | 12 (10.9%)           | 6 (5.5%)        | 2 (1.8%)       | 25 (22.7%)     | 85             | 1.88 | 1.05 |

Table 3: Students' responses regarding the demandingness of the selected study methods and tasks that took place during the pandemic in the form of distance learning

The students found two individual tasks to be the most demanding: *individual literature study* ( $M = 3.57$ ) and *individual research for seminar projects* ( $M = 3.10$ ). Most students (85.5%) found individual studying of the required course literature demanding or very demanding, which was not surprising because first-year students are not yet used to that extent of individual learning. In our experience, students had relied mainly on the explanations given by teachers, and they had often mentioned that they would have preferred to have textbooks rather than a list of required study literature. They probably perceived individual research for seminar projects as demanding because as first-year students, they did not yet have sufficient methodological knowledge and were not yet skilled in successful literature searches.

Interestingly, individual literature studying was the only study method where significant differences between the students of different study programmes were found regarding perceived demandingness (Kruskal–Wallis test:  $\chi^2 = 21.74$ ,  $df = 3$ ,  $p = .000$ ). Students of social pedagogy found individual studying the most demanding, followed by students of special and rehabilitation pedagogy, preschool education and speech and language therapy and surdopedagogy (mean ranks = 57.60, 39.70, 34.36 and 21.39, respectively).

The students found the *online presentations of seminar projects* moderately demanding ( $M = 2.80$ ), and the least demanding was the *communication between teachers and students* ( $M = 1.88$ ). This could mean that teachers were available for e-mail communication almost all the time and that students were aware that the Internet was the only possible communication channel. Because there were no office hours, students may have felt more relaxed about communicating with their teachers. Interestingly, online lectures, tutorials and seminars were found to be the most beneficial for competence development but not as demanding. We suspect that this was also because of the detailed and well-planned instructions given to students.

*Online lectures* were perceived as not very demanding (44.5% of students perceived them as not demanding or little demanding) probably because of the mostly passive role of the students or because of the detailed and clear explanations. Our positive experience was that we provided students with study materials in advance and illustrated the learning content through several practical case studies.

Using a qualitative approach, we wanted to gain some insights into the students' perceptions of the study difficulties experienced during the lockdown.

Thirty students described the challenges or problems they faced when the study process switched to online platforms. They described 48 challenges in total, and two students wrote that they had no difficulties. We will present some illustrative answers below.

| Study difficulties                             | f |
|------------------------------------------------|---|
| Organisational issues                          | 8 |
| Large amount of individual study (challenging) | 7 |
| Lack of motivation for learning                | 7 |
| Access to the literature                       | 6 |
| Technical issues                               | 6 |
| Confusion about the requirements               | 4 |
| Communication obstacles                        | 3 |
| Work load                                      | 2 |
| Lack of explanation                            | 2 |
| Anxiety because of epidemic, health concerns   | 1 |
| Disturbances at home                           | 1 |
| I learned less as I would have otherwise       | 1 |

Table 4: Qualitative analysis (frequencies) of students' answers regarding study difficulties because of the distance learning ( $N = 30$ )

The students most often faced organisational problems: *»In the beginning we received so many instructions that I did not know where to start«*; *»I did not know how to organise everything I had to do, new demands came up that I did not know about before«*; *»I was confused about what I had to do«*. They found individual studying of the course literature particularly challenging: *»I had difficulty defining the central message of the texts«*; *»I can hardly concentrate while reading, I prefer to listen to the explanation«*; and *»It was a challenge for me to read the required documents«*. There was also often a lack of motivation to study: *»I was not motivated to study«* and *»I became lazy and unmotivated because I was at home all the time«*. Students often reported their feelings and changing emotions, meaning that the lockdown had an important impact on their psychological needs and willingness to learn. Their responses were mostly related to their affected need for competence (Ryan and Deci 2017).

Access to some literature units (printed editions of books, workbooks, manuals, etc.) was difficult because libraries were closed: *»I could not access literature because the libraries were closed«*; *»When the libraries finally opened, all the books were gone very quickly«*. There were also technical problems (e.g. *»First I had some problems with the technical equipment—microphone, camera, Internet connection«*; *»I could not access some computer programs«*).

Some students felt confused because of the change in the study conditions, had communication problems with their professors, felt they had too much work or were worried about their parents' health. One student reported that she was often disturbed by other family members, and another student stated that she was learning less than she would have under normal circumstances.

### *Students' experiences with online exams*

An important part of learning is the examination process. Exams should be designed in such a way that students can show their knowledge without distracting factors. During the pandemic, lecturers were able to choose whether to organise the final exams online (e.g., via the online application Exam.net and camera-monitored via Zoom or MS Teams) or in lecture halls, maintaining physical distance and taking preventive measures. In our study, the students were asked how they perceived the stress level of the online exams compared with their previous experiences with paper–pencil exams in university lecture halls during the winter exam period.

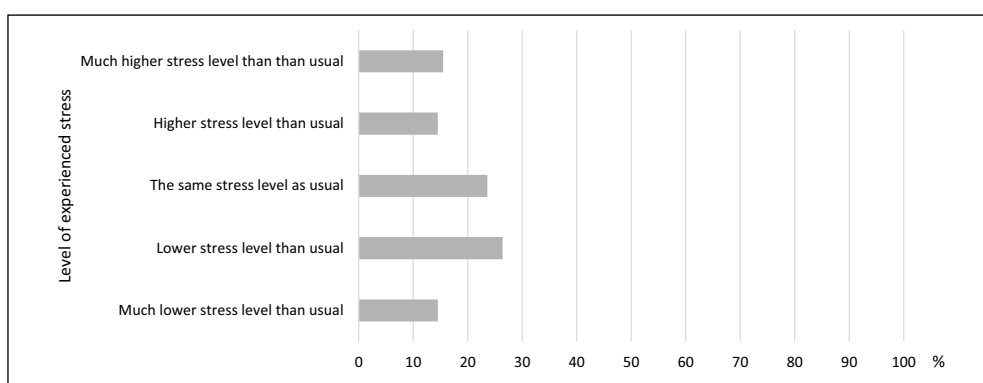


Figure 2: The level of experienced stress of the students when taking online exams compared with the usual experience of taking exams in lecture halls.

The students reported that the online exams were similarly stressful as the exams in lecture halls ( $M = 2.89$ ,  $SD = 1.31$ ). Interestingly, 23.6% of the students reported that the stress level was the same as in paper–pencil exams in lecture halls, and 40.9% of the students reported that online exams were less (or much less) stressful than usual. For 30.0% of the students, online exams were more stressful than usual. The level of stress during the exams seemed to depend on the personal characteristics of the students—students differed in their knowledge, test anxiety, resilience, test-taking skills and so forth.

We tested whether full-time and part-time students experienced the stress level differently but found no significant differences (Mann–Whitney test:  $Z = -.228$ ,  $p = .820$ ). Similarly, there were no significant differences between the students of different study programmes (Kruskal–Wallis test:  $chi-square = .153$ ,  $df = 3$ ,  $p = .985$ ).

Within the study, we also wanted to investigate the factors that could influence the students' context of the online exams. The students were asked to rate the factors listed below on a 5-point scale (from *very negative* to *very positive*).



| Exam-related factors                                                      | Student's perception of selected factors |            |            |            |               | M    | SD   |
|---------------------------------------------------------------------------|------------------------------------------|------------|------------|------------|---------------|------|------|
|                                                                           | Very negative                            | Negative   | Neutral    | Positive   | Very positive |      |      |
| I was able to wear comfortable clothes during the exam.                   | 0 (0.0%)                                 | 0 (0.0%)   | 6 (5.5%)   | 37 (33.6%) | 61 (55.5%)    | 4.53 | 0.61 |
| I did not lose time to get to the university.                             | 0 (0.0%)                                 | 2 (1.8%)   | 11 (10.0%) | 22 (20.0%) | 69 (62.7%)    | 4.52 | 0.76 |
| I was able to repeat the subject matter until the start of the exam.      | 0 (0.0%)                                 | 2 (1.8%)   | 14 (12.7%) | 32 (29.1%) | 56 (50.9%)    | 4.37 | 0.79 |
| I was alone in a room during the exam.                                    | 0 (0.0%)                                 | 6 (5.5%)   | 14 (12.7%) | 29 (26.4%) | 55 (50.0%)    | 4.28 | 0.91 |
| I was able to take the exam at home or at a place that I chose by myself. | 0 (0.0%)                                 | 3 (2.7%)   | 10 (9.1%)  | 48 (43.6%) | 43 (39.1%)    | 4.26 | 0.75 |
| Taking the exam over the application exam.net                             | 4 (3.6%)                                 | 11 (10.0%) | 42 (38.2%) | 25 (22.7%) | 21 (19.1%)    | 3.47 | 1.06 |
| Supervision by the teacher through the web camera and microphone.         | 7 (6.4%)                                 | 24 (21.8%) | 48 (43.6%) | 14 (12.7%) | 11 (10.0%)    | 2.98 | 1.03 |

Table 5: Students' perceptions of the selected exam-related factors ( $N = 104$ )

The students in our research study found the most positive factors to be those that support their need for autonomy (Ryan and Deci 2017), which are also internal and controllable (Weiner 1985, 2010): comfortable clothing, choice of exam location and regulation of their time (not losing time getting to the university and hence being able to study until the start of the exam). Factors with an external locus of control (Weiner 1985, 2010) were perceived as neutral: taking the exam via the Exam.net application and supervision by the teachers. Indeed, both of these factors were determined in advance as part of the exam procedure and were obligatory for all students. Here, 28.2% of the students perceived the supervision by web camera and microphone as negative.

The students' stress level experienced during the exam situation is related to their concerns. We were interested in the factors that might have had a negative impact on the students' participation in the exam-taking process. We listed some of them and asked students to evaluate them (Table 6).

| Exam-related factors | N   | The level of worry |                  |            |            |              | M    | SD   |
|----------------------|-----|--------------------|------------------|------------|------------|--------------|------|------|
|                      |     | Not worried        | A little worried | Neutral    | Worried    | Very worried |      |      |
| Internet connection  | 105 | 7 (6.4%)           | 17 (15.5%)       | 13 (11.8%) | 31 (28.2%) | 37 (33.6%)   | 3.70 | 1.29 |
| Technical equipment  | 104 | 16 (14.5%)         | 17 (15.5%)       | 15 (13.6%) | 32 (29.1%) | 24 (21.8%)   | 3.30 | 1.39 |
| Submitting the exam  | 104 | 12 (10.9%)         | 27 (24.5%)       | 13 (11.8%) | 30 (27.3%) | 22 (20.0%)   | 3.22 | 1.31 |
| Typing               | 104 | 33 (30.0%)         | 20 (18.2%)       | 17 (15.5%) | 19 (17.3%) | 15 (13.6%)   | 2.64 | 1.45 |

Table 6: Factors that might have negatively affected exam taking

During the exam-taking process, the students were the most worried about having a functioning Internet connection ( $M = 3.70$ ), with almost two-thirds of the participants (61.8%) being worried or very worried about whether it would work effectively or not. They were also worried about the technical equipment, such as a working web camera, microphone and connection to applications (e.g., MS Teams, Zoom) ( $M = 3.30$ ; about half of the participants were worried or very worried about this). Similarly, they were worried about the exam submission ( $M = 3.22$ ). All these factors are external and uncontrollable but unstable (Weiner, 1985; 2010). A successful submission of an exam can also depend on the experience of the students—for this reason, we allowed students to take part in a trial exam. It may have been the case that those students who had not tried trail exam in advance were more worried. The students were not worried about typing, probably because they were quite skilled here because this generation uses typing for daily communication with peers.

| Insights regarding exam-taking experience                              | f           |
|------------------------------------------------------------------------|-------------|
| Positive                                                               |             |
| More pleasant at home as in the lecture hall                           | 5           |
| Less stressful as in the lecture hall (did not take it very seriously) | 3           |
| Enough time                                                            | 3           |
| I liked the exam.net application                                       | 2           |
| No transfer of stress from other colleagues                            | 1           |
| Better concentration at home                                           | 1           |
| No worries about getting to the university                             | 1           |
| Easier to correct sentences during the exam                            | 1           |
|                                                                        | $\Sigma 17$ |
| Negative                                                               |             |
| More stressful as in the lecture hall                                  | 11          |
| Technical issues                                                       | 10          |
| Unpleasant feeling because of the monitoring by webcam                 | 6           |
| Would prefer taking the exam in the lecture hall                       | 4           |
| No colleague support before the exam                                   | 2           |
| Not enough time                                                        | 2           |
| Troubles with typing                                                   | 2           |
| Several uncertainties                                                  | 2           |
| I prefer the paper–pencil form                                         | 1           |
|                                                                        | $\Sigma 40$ |

Table 7: Qualitative analysis (frequencies) of students' answers regarding distance (online) exam taking ( $N = 30$ )

Thirty students described their perceptions of online exams (compared with the paper–pencil exams in the lecture hall); we analysed 57 insights altogether (Table 7). The students reported considerably more negative than positive insights. The most frequent remark was that online exams were more stressful ( $f = 11$ ) (e.g., »I was stressed because I did not know what would happen in case of some technical problems«; »I was stressed because of different, more demanding conditions than at the university«). Here, they did not have an internal locus of control (Weiner 1985, 2010). However, some found online exams less stressful ( $f = 3$ ) (e.g., »I was much more relaxed at home than in the lecture hall because I was in my home environment«). Here, there was an internal locus of control over some factors (Weine 1985, 2010). Several students reported technical problems ( $f = 10$ ), for example, »I did not know how the technology would work, like Internet connections, applications and programmes«; »I was afraid to click on a wrong button and be 'locked out' of the exam application«; and »One of the professors threatened us not to pass the exam if we had technical problems during the exam«. The students were monitored by microphone (to prevent phone calls between each other during the exam) and webcam (to prevent cheating), so taking the exam felt quite uncomfortable ( $f = 6$ ; e.g., »I felt uncomfortable because I had to look directly at the screen all the time, because otherwise the professor would think I was cheating—at the university I usually look around a lot when I try to concentrate, to form a good answer or to recall some learned facts from my memory«; »I felt uncomfortable because I felt that someone was watching me all the time«). Some students found online exams more enjoyable than those at university lecture halls (e.g., »I loved being able to drink my 'home coffee' during the exam«; »I enjoyed taking the exam from my home chair«; »I was more relaxed in my home environment«). Two students stated that they missed their peers as a source of support before the exam, and another student mentioned that she felt less stressed because just before the exam, she was not surrounded by nervous colleagues. Students also mentioned that they were worried that they would not have enough time ( $f = 2$ ) or that they felt comfortable knowing they had enough time ( $f = 3$ ). Two students mentioned problems with typing, but one student mentioned that it was easier to correct mistakes on a computer than on paper.

Although they had expressed several concerns about the online exams, we recognised that the students were able to handle the online exams in our courses without any serious technical problems; they mastered the exam situation and successfully passed the exams.

## Conclusions

The study process in higher education in the spring of 2020 was seriously affected by the Covid-19 pandemic. The shift from face-to-face to online teaching required an adaptation of university teachers and students, with both facing several challenges.

In our study, we found that the online lectures contributed the most to the students' competence development but were not perceived as very demanding,

probably because of the (mostly) passive role of the students. Individual research for seminar projects was important for students' competence development and was also perceived as demanding. Students perceived individual literature studying as the most demanding study method, which became a prevalent study method during the lockdown. Students faced several problems during individual learning, from trouble with concentrating on tasks to finding the central message of the study texts. Students perceived the contribution of the study methods and tasks to students' competence development and their demandingness similarly—there were no differences regarding the full-time vs. part-time students and almost no differences regarding the study programme. The students reported several study difficulties, such as organisational issues, work overload, lack of motivation for learning, hardly accessible study literature and technical issues, to name a few.

Another important aspect of the distance teaching and learning process were online exams, which were generally perceived as just as stressful as the usual written exams (in a paper–pencil form in a lecture hall). The students mentioned some positive aspects of online exams, such as taking the exam wearing comfortable clothes, saving time (not losing time getting to the university, hence being able to study until the start of the exam) and being at home and alone during the exam. On the other hand, they were concerned about having a functioning Internet connection, technical equipment and exam submission; also, as a slightly negative aspect, they perceived being supervised by the teacher through the web camera and microphone. When describing their experience with online exams, students listed more negative than positive aspects. However, regarding exams at the courses of the authors of the present paper, all students successfully mastered online exam-taking skills, such as accessing the exam via an application and typing and submitting the exam.

According to the results of our study, the students evaluated the study methods and tasks as beneficial for their competence development and as not too demanding. The students successfully mastered the new skills required for online exam taking. They reported some study difficulties that need to be taken into account by the university teachers in the future planning of the study process because it seems that online teaching and learning will be present for some time.

It is important that university teachers strive for high-quality, diverse and multisensory teaching and learning; that they establish positive interactions with their students through online platforms; and that they take into account various challenges that students face during the online study process. Teachers and students could benefit from gaining additional knowledge and support in using ICT. Particular attention should be paid to the mental health and well-being of students and teachers; the social and emotional aspects of teaching and learning should also be taken into account. The face-to-face teaching and learning process is not completely comparable to its online adaptation. This is particularly important for pedagogical faculties, where university teachers need to be aware of the complex nature of the teaching profession, the integration of verbal and nonverbal communication and authentic interaction because they represent important role models of teaching for future teachers.

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Polona GRADIŠEK (Univerza v Ljubljani, Pedagoška fakulteta, Slovenija)

Alenka POLAK (Univerza v Ljubljani, Pedagoška fakulteta, Slovenija)

## VPOGLED V UČENJE IN DOŽIVLJANJE IZPITOV PRI ŠTUDENTIH MED PANDEMIJO COVIDA-19

**Povzetek:** Pandemija covid-19 je v študijskem letu 2019/2020 v Sloveniji kot tudi drugod po svetu močno zaznamovala izvedbo poletnega semestra študija. Iz poučevanja in učenja »v živo« smo z uporabo različnih informacijsko-komunikacijskih platform, kot npr. spletnih učilnic v okolju Moodle, aplikacij ZOOM, MS Teams, Exam.net idr., prešli na poučevanje in učenje na daljavo. Nastale zdravstvene in družbene okoliščine so pomembno vplivale na vključenost študentov v študijski proces, na formalne in neformalne interakcije med študenti ter med visokošolskimi učitelji in študenti, pa tudi na psihološke potrebe študentov na področju njihovih medosebnih odnosov, kompetenc in občutkov avtonomnosti. Z empirično raziskavo na vzorcu 110 študentov prvih letnikov različnih pedagoških smeri na Pedagoški fakulteti Univerze v Ljubljani smo raziskali, kako so v času pandemije covid-19 določene metode poučevanja in učenja ter študijske obveznosti prispevale k razvoju kompetenc študentov in kako zahtevne so se jim zdele. Analizirali smo tudi, kako so študenti doživljali opravljanje izpitov na daljavo. Rezultati raziskave so pokazali, da so po mnenju študentov izbrane metode poučevanja in učenja ter opravljanje študijskih obveznosti na daljavo pozitivno prispevali k razvoju kompetenc študentov; ti so uspešno razvijali nove spretnosti, tudi tiste povezane z opravljanjem izpitov na daljavo. Študenti so izpostavili tudi nekatere težave in skrbi, ki so ta proces v tistem obdobju spremljale. Kljub temu, da je poučevanje in učenje na daljavo lahko uspešno, pa menimo, da ne more nadomestiti poučevanja »v živo«, zlasti ne na pedagoških fakultetah, kjer so visokošolski učitelji študentom – prihodnjim pedagoškim delavcem – pomembni modeli profesionalnega pedagoškega vedenja.

**Ključne besede:** pandemija covid-19, visokošolski študij, poučevanje, učenje, ocenjevanje, učenje na daljavo

**E-naslov:** polona.gradisek@pef.uni-lj.si