# DISTANCE LEARNING DURING THE COVID-19 CRISIS AS PERCEIVED BY PRESERVICE TEACHERS

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## ABSTRACT

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| Aim/Purpose | This study examined learning during the COVID-19 crisis, as perceived by preservice teachers at the time of their academic studies and their student teaching experience. |
| Background | The COVID-19 crisis is unexpected. On one hand, it disrupted learning in all learning frameworks, on the other, it may create a change in learning characteristics even after the end of the crisis. This study examined the productive, challenging, and thwarting factors that preservice teachers encountered during their studies and in the course of their student teaching practice during the COVID-19 period, from the perspective of preservice teachers. |
| Methodology | The study involved 287 students studying at teacher training institutions in Israel. The preservice teachers were studying online and, in addition, engaged in online teaching of students in schools, guided by their own teacher. The study used a mixed method. The questionnaire included closed and open questions. The data were collected in 2020-2021. |
| Contribution | Identifying the affecting factors may deepen the understanding of online learning/teaching and assist in the optimal implementation of online learning. |
| Findings | *Online learning experience.* We found that some of the lessons at institutions of higher learning were delivered in the format of online lectures. Many preservice teachers had difficulty sitting in front of a computer for many hours—"Zoom fatigue." Some preservice teachers wrote that collaborating in forums with others made it easier for them. Some suggested diversifying by digital means, incorporating asynchronous units and illustrative films, and easing up on online lectures as a substitute for face-to-face lectures. |

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| | *Online teaching experience in schools.* The preservice teachers' descriptions show that in lessons taught in the format of lectures and communication of content there were discipline problems and non-learning. According to the preservice teachers, discipline problems stemmed from difficulties concentrating, physical distance, load, and failure to address the students' difficulties. |
| Recommendations for Practitioners | The findings suggest that it is recommended to combine synchronous lectures and meetings with asynchronous learning that integrates 21st century skills. It is advisable to use collaborative tools, such as forums, shared files, and open content repositories, and to encourage meaningful dialogue between learners, and between learners and their teachers, to better deal with the physical distance. |
| Recommendations for Researchers | A change in the learning medium also requires a change in the definition of objectives and goals expected of each party—students, teachers, and parents. All parties must learn to view online learning as a method that enables empowerment and the application of 21st century skills. |
| Impact on Society | Teachers' ability to deploy 21st century skills in an online environment depends largely on their experience, knowledge, skills, and attitude toward these skills. |
| Future Research | This study examined the issue from the perspective of preservice teachers. The issue should also be studied from the perspective of lecturers in academia, teachers in schools, and school students. Future studies should examine whether the change that took place during the COVID-19 period in relation to the deployment of 21st century skills, as experienced by all parties, led to the continued use of these skills in the post-corona period. Continued use depends largely on past experiences, knowledge, skills, and attitudes toward these skills. |
| Keywords | distance learning, digital environment, social emotional learning – SEL, digital literacy, e-readiness, m-learning, teacher presence, social presence, Zoom fatigue, COVID-19 |

# INTRODUCTION

In 2020, institutions of higher education reorganized in real time to continue to teach during the COVID-19 period. This study examines learning during the COVID-19 crisis, as perceived by preservice teachers at the time of their academic studies through online distance learning, and their online student teaching experience at schools. The purpose of the study was to learn from the experience of the outbreak of the crisis, the factors, challenges, and failures that characterized learning during the COVID-19 crisis. Identifying these factors is likely to deepen the understanding of distance learning/teaching and assist in the optimal implementation of this method. Teachers' ability to deploy 21st century skills in an online environment depends largely on their experience, knowledge, skills, and attitude toward these skills (Holmes et al., 2018; Kennedy, 2016; Lampert, 2010). It is therefore important to examine the learning and teaching experience of preservice teachers, who will be teaching students in schools.

# RESEARCH REVIEW

## LEARNING IN THE SHADOW OF THE COVID-19 CRISIS

Blended and online courses have been incorporated in the curriculum of academic institutions before the COVID-19 crisis, (Seaman et al., 2018; Soffer & Cohen, 2019; Zilka et al., 2018, 2019). The

COVID-19crisis accelerated the deployment of online learning in academia and launched the process of total distance learning (Kwong et al., 2020). Researchers (DePietro, 2020; Yan, 2020; Zilka et al., 2021) have argued that the emergency situation, the spread of the epidemic, isolation, closures, and social distancing resulted in exposure to large-scale distance learning. Within the challenges of transition to online learning, are nested also the opportunities to change teaching and learning perceptions and to integrate new ways into the process of learning and teaching in higher education. Dhawan (2020) noted that institutions must take advantage of the crisis and the need for distance learning to assimilate innovative pedagogical approaches and make the best use of online learning.

## DISTANCE LEARNING

Distance learning refers to a digital teaching system that involves learners and teachers separated from each other by physical distance. An online environment allows for intensifying the learning process, and it usually provides a broad platform for inquiry-based learning, integration of texts (visual, auditory, verbal), integration of assignments requiring high-level thinking, and more. Because of the dynamism and variety of possibilities it provides, online learning can contribute to the creation of a learning environment that makes possible coping with problems in interpersonal communication skills and supports collaboration and sharing. At the same time, physical separation between teacher and learners may lead to "transactional distance." This concept, coined by Moore (1993), refers to a psychological-communicative space that is liable to emerge in the learning process between the teacher and the learners, leading to negative feelings, anger, gaps in understanding, and misconceptions of the learners about themselves and the learning process. According to Moore, the psychological-communicative space is not a permanent factor, but a variable that can be reduced.

### Training preservice teachers toward effective integration of online environments

Researchers (Holmes et al., 2018; Kennedy, 2016; Lampert, 2010; Tsai & Tsai, 2019; Zilka, 2020; Zilka et al., 2018; Zilka et al., 2019) claim that the key to effective use of digital environments is to choose meaningful pedagogy, appropriate for the content and the needs of the learners. They claim further that effective teacher training programs should be based on learning experiences, with an emphasis on the use of pedagogical models for the effective integration of digital environments in teaching. Training programs should address the needs of different learners and build collaborative learning communities, enabled by identification of the obstacles that preservice teachers encounter in the online teaching and learning processes in digital environments. The goal is for the preservice teachers' training process to increase their e-readiness for effective integration of digital environments. The digital environment changes a person's existential, social, and cultural environment and affects one's behavior, lifestyle, communication with others, the extent of the need for information and the way in which it is located and processed, as well as one's thinking patterns. At present, digital environments allow breaking down the boundaries of time and space and offer fascinating and varied opportunities for collaboration and learning (Feenberg, 2010; Mahler, 2012). Researchers (Asterhan & Bouton, 2017; Cohen et al., 2015; Rosenberg & Asterhan, 2018) found that digital environments increase learners' motivation, as well as their academic and social engagement, creating diverse instructive environments. They help learners understand the study material by means of images, animation, simulations, and videos available on the Internet. Researchers examined the issue of integrating digital environments into the learning process (Carter, 2018; Chicioreanu & Amza, 2018; Jan et al., 2016; Johnson et al., 2011) and found that their availability "anywhere and anytime" makes it possible to turn learning into the learners' daily routine activity, fostering their involvement and collaboration. It also grants equal opportunities to learners with special needs (Ardito et al., 2006; Gikas & Grant, 2013). Researchers use the term "m-learning," defined as any learning activity and supportive learning, carried out through digital environments (Asterhan & Bouton, 2017; Cohen et al., 2015; Jan et al., 2016; Johnson et al., 2011; Rosenberg & Asterhan, 2018). Researchers (Mayer, 2014; Zohar & Levy, 2019) found that factors that determine the "user experience" stem from the capabilities and limitations of the sensory system and from the basic processing of sensory information in the brain.

Therefore, changes such as the size and color of the font, background color, and text spacing may lead to a change in the learning process.

**Digital literacy**

Digital literacy (OECD, 2018, 2019a, 2019b; Zilka, 2017a, 2019b) refers to the "21st century skills" required in the process of learning in digital environments that relate to identifying the need for information, finding information, evaluating information, writing, processing, and integrating information using a variety of digital tools; understanding the characteristics, benefits, and limitations of digital environments; and being able to use a range of tools and commands, and to combine different tools, as formulated in the principles outlined by the OECD (2019a) in the Life Long Learning (LLL) program. Digital literacy involves principles such as developing skills in the use of advanced tools, and acquiring information literacy, including such skills such as information retrieval, dynamic processing, identification of the essential and non-essential information, and filtering concepts, ideas, and values contained in the text. It involves information processing and one's own interpretation of different parts of the text, asking questions, analyzing claims, and justifying or rejecting them. It also involves forming a position, expressing an opinion, and taking a stand, integrating information from a variety of digital texts. It requires conceptual mapping of digital text, developing a critical attitude toward ideas emerging from the digital text, within the framework of a peer dialogue, drawing conclusions based on various content components that appear in the digital text, and conducting inquiry-based learning around a dilemma or problem. Using collaborative tools, such as forums, shared files, blogs, and open content repositories helps create collaboration between students, between teachers and students, and between teachers, students, and parents. Teaching-learning methods vary, and include learning in small groups, integrating online environments or focusing on a given topic, virtual tours of museums worldwide, and more. Each unit of study and each subject has a clear gauge by which it is assessed.

## SOCIAL EMOTIONAL LEARNING (SEL)

The main goals in the socio-emotional approach are cultivating a sense of resilience, empathy, self-efficacy, growth mindset, decision-making ability, self-awareness, self-management, social awareness, interaction management, and accepting responsibility. Researchers (Husaj, 2016; Zilka, 2017b) claim that teaching by means of this approach promotes the application of social and emotional skills in ways that are socially and culturally adapted to learners. This is based on the understanding that emotional and social difficulties affect the learner's emotional wellbeing, academic achievement, and general mood. Researchers divide the objectives of the method into five interconnected sets: self-awareness, self-management, social awareness, interaction management, and acceptance of responsibility (Beauchamp, 2015; Husaj, 2016; Liu, 2015; Zilka, 2017b). The present study examines all five sets. *Self-awareness* refers to awareness of feelings, desires, needs, and behaviors. *Self-management* refers to attributes related to regulating, appreciating, understanding, and managing emotions, and turning information into knowledge to guide and direct an individual. *Social awareness* refers to awareness and mindfulness of our own and others' feelings. *Interaction management* refers to paying attention to the nature of interactions with others (cultivating, promoting, harming); making eye contact; using encouraging or distancing language; showing awareness of emotions, emotion management, and empathy for the emotions of others, which affect one's relationships with oneself and with others. *Acceptance of responsibility* involves a decision to change aspects of behavior of the individual's choice, and the implementation of this decision. After choosing the preferred option, the individual builds milestones for future action that are likely to lead to the desired change in behavior (Beauchamp, 2015; Liu, 2015; Shoffner, 2009). Researchers' assumption (Husaj, 2016; Zilka, 2017b) is that social emotional skills are acquired. These include self-awareness, emotion management, assertiveness, self-fulfillment, motivation, empathy, ability to control impulses, self-discipline, perseverance, resilience, relationship management, social responsibility, adaptation, problem solving, stress management, coping with stress, and delay of gratification.

## THE AIM OF THIS STUDY

The aim of this study was to shed light on the productive, challenging, and thwarting factors that preservice teachers encountered during their studies and in the course of their student teaching during the COVID-19 period, from the perspective of preservice teachers. This study examined which factors promote and which ones hinder learning in an online environment for preservice teachers; the social and emotional aspects of preservice teachers' experience; identified critical elements and frustrations in stressful situations; identified positive and negative elements in the learning experience; described the use of online tools and learning skills in a digital environment; and examined the use of tools and skills for teaching and collaborative learning in dealing with physical distance. As is well known, online teaching and learning make it possible to create social learning connections through online collaborative learning.

This study examined the following questions:

- What are the factors that advance or hinder learning in an online environment for preservice teachers?

- How do preservice teachers characterize each of the social emotional arrays they experienced in the course of their studies during the COVID-19 period?

- What are the critical elements that cause preservice teachers' stress, frustration, and overload?

- Which tools and digital skills were used, and were these tools and skills appropriate?

- Which tools and skills were used for teaching and collaborative learning, and how?

# METHOD

This was a mixed-method study. The questionnaire contained closed and open-ended questions. The data were collected in 2020-2021. The study was both quantitative and qualitative, based on triangulation to verify and validate findings. Winnowing and thick description are two common practices in this research method. In this study a great deal of winnowing was used to highlight the main findings. Winnowing allows one to focus on what is most important and present what is most meaningful and convincing (Ely et al., 1997; Wolcott, 2001).

All participants were adults who consented to participate in the study and completed a questionnaire.

The study received approval from the institutional review board (IRB) of Achva Academic College, Israel.

## SAMPLE

The study sample included 287 preservice teachers studying at teacher training institutions in Israel, 74% women, 23% men; 57% of participants were aged 20-30, 35% aged 30-40, and the rest aged 40 and over. Participating preservice teachers were in the process of studying toward a teaching certificate; some had a master's degree (19%) or a PhD (12%).

Preservice teachers experienced learning in online courses at the teacher training institution where they studied, and also experienced teaching students in schools in an online environment, coached by their own teachers.

## RESEARCH TOOLS

*A questionnaire with closed and open-ended questions.* The questionnaire relies on the following questionnaires used in previous studies: Digital Literacy Questionnaire, Digital Gap Indices Questionnaire, Self-Efficiency Questionnaire, Motivational Questionnaire, and Challenge Questionnaire (Bandura,

1986; Lazarus & Folkman, 1988; Pintrich et al., 1991; Zilka, 2017a, 2017b, 2019a, 2019b; Zilka et al., 2019).

The questionnaire examined the following categories of data:

1.  Demographic details, age, gender, year of study, etc.

2.  Learning and teaching in online courses: tools and skills. Preservice teachers were asked to read a set of statements and rate how much they agree with each statement, from Not at all (1) to Very much (5). For example: What digital tools and what learning skills were used in the online courses you took or taught during the COVID-19 crisis? What technological measures can, in your opinion, improve your online learning/teaching process? A reliability test revealed a Cronbach's alpha of $\alpha=.77$ for the variable.

3.  SEL aspects and feelings of self-efficacy, threat, challenge, and motivation, as well as attitudes and feelings about learning experience during the COVID-19 period. Preservice teachers were asked to read a set of statements and rate how much they agree with each statement, from Not at all (1) to Very much (5). For example: I feel stressed because of online learning; I think that for me online teaching is at least as effective as face-to-face teaching; I found that I had better learning habits than I thought; Online forums: I feel like I have something to learn from others / I feel it's a waste of time; Because of the change in the way I learn, I feel upset and sad; Because of the change in the way of learning, I developed my ability to learn independently. We examined the extent to which the following were reflected in the answers: preservice teachers' commitment to their learning process; development of their reflective skills; development of their social emotional skills; encouragement of dialogue between preservice teachers; addressing differences between students. We conducted a principal component analysis factor with Varimax rotation for the questionnaire, which included 39 statements. Confirmatory factor analysis revealed three factors that together explain about 56% of the overall variance of the scale. Below is a breakdown of the results for the three factors, and the results of preliminary reliability tests conducted in order to construct the questionnaire indices. Factor 1, Motivation for learning in an online environment (21 statements), had a Cronbach's alpha reliability score of $\alpha=.95$ for the variable; Factor 2, Dealing with difficulties and problems (12 statements) had a Cronbach's alpha reliability score of $\alpha=.75$ for the variable; Factor 3, Sense of self-efficacy (6 statements) had a Cronbach's alpha reliability score of $\alpha=.85$ for the variable.

4.  Would you prefer, after the end of the COVID-19 crisis, for studies to return to what they had been before the crisis? Remain online, similarly to the COVID period? Become hybrid—blended learning, both online and face-to-face? The transition from face-to-face learning to online learning was for you… simple, distressing, fun, challenging, difficult.

5.  Open questions. Significant experiences in learning/teaching during the COVID-19 period, positive/negative elements in the online learning/teaching experience. Which learning/teaching experiences were most significant for you during the COVID-19 period? List positive elements in the online learning/teaching experience. List negative elements in the online learning/teaching experience.

## QUALITATIVE METHODOLOGY.

Discourse analysis was conducted on the findings obtained from the answers to open-ended questions, based on the approach described by Adler and Adler (2008), Atkinson and Delamont (2006), and Hammersley (2008). The students' answers were analyzed, coded by themes, and classified into factors. Distinct elements were identified, and contrasting, complementary, and explanatory themes were formulated. The frequency with which themes were addressed by respondents was mentioned.

Emphasis was placed on analyzing the contextual discourse regarding the complexity of the experience in the online environment, and in the learning and teaching process, with the aim of creating a comprehensive mapping of the factors that promote, challenge, and hinder learning in the shadow of COVID-19.

## FINDINGS

Below we present the quantitative and the qualitative findings, with supporting quotes from the pre-service teachers' answers.

### DIGITAL TOOLS AND LEARNING SKILLS

Participants were presented with a list of various digital tools and learning skills and asked which ones they used during the COVID-19 period in the online courses they took. Table 1 shows the distribution of the frequency of digital tool use for the entire sample (the table shows the percentages of participants who answered that they did use tools).

**Table 1: Prevalence of participants' learning skills and use of digital tools**

| Digital tools | % | Learning skills | % |
|---|---|---|---|
| Course website | 80% | Finding information | 22% |
| Real-time lectures | 88% | Information processing | 11% |
| Links to videos from the Internet | 50% | Merging of texts | 9% |
| Exercise pages | 23% | Dynamic and process reading | 11% |
| Interactive environment | 20% | Asking questions | 31% |
| Digital libraries / learning centers / information centers | 22% | Claim analysis | 13% |
| Personal tasks on the course website | 47% | Expression of opinion / position | 26% |
| Group assignments on the course website | 21% | Merging of information | 11% |
| Links to free online databases | 9% | Conceptual mapping of digital text | 8% |
| Forums | 10% | | |

### SOCIAL EMOTIONAL ASPECTS (SEL), ATTITUDES, AND FEELINGS ABOUT THE LEARNING EXPERIENCE DURING THE COVID-19 PERIOD

Participants were asked to grade 39 statements (on a scale of 1-5) regarding attitudes and feelings about their learning experience during the COVID-19 period. The statements were divided into sub-categories: motivation for learning in an online environment ($\alpha = 0.95$) –level of motivation for learning was medium-high, with an average of 3.4; dealing with difficulties and problems ($\alpha = 0.75$) – the level of dealing with difficulties and problems was medium-high, with a mean of 3.4); feeling of self-efficacy ($\alpha = 0.85$) – level of self-efficacy was moderate, with a mean of 3.2.

## CORRELATIONS BETWEEN STUDY VARIABLES

To examine the correlations between the main research variables—use of digital tools, use of learning skills, self-efficacy, coping with difficulties and problems, motivation for learning—we conducted a Spearman rank correlation.

Significant positive correlations were found between the use of digital tools and the use of learning skills ($rs = 0.54$, $p < .01$), self-efficacy ($rs = 0.20$, $p < .01$), coping with difficulties and problems ($rs = 0.17$, $p < .01$), and motivation for learning ($rs = 0.23$, $p < .01$). A higher level of use of digital tools was associated with a higher level of use of learning skills, self-efficacy, coping with difficulties and problems, and motivation for leaning.

Significant positive correlations were found between the use of learning skills and self-efficacy ($rs = 0.14$, $p < .01$) and motivation for learning ($rs = 0.20$, $p < .01$). A higher level of use of learning skills was associated with a higher level of self-efficacy and motivation for learning.

Significant positive correlations were found between self-efficacy and coping with difficulties and problems ($rs = 0.45$, $p < .01$) and motivation for learning ($rs = 0.76$, $p < .01$). A higher level of self-efficacy was associated with a higher level of coping with difficulties and problems and motivation for learning. A significant positive correlation was also found between coping with difficulties and problems and motivation for learning ($rs = 0.26$, $p < .01$). A higher level of coping with difficulties and problems was associated with a higher level of motivation for learning.

Participants were asked:

After the COVID-19 crisis, do you prefer the studies... to be...

       Online studies, similar to studies during the COVID-19 period: 14%

       Just like before the COVID-19 crisis: 16%

       Hybrid studies – both types. Online, blended, and face-to-face learning: 46%

The transition from face-to-face learning to online learning was for you...

       Simple: 5%

       Distressing: 16%

       Fun: 22%

       Challenging: 21%

       Difficult: 36%

### Positive and negative elements in the online learning and teaching experience

Participants were asked open-ended questions about meaningful learning and teaching experiences during the COVID-19 period, and about positive and negative elements in the online learning and teaching experience. We conducted a discourse analysis, analyzed the students' answers, coded them according to themes, and classified them by factors. We identified distinct elements and formulated contrasting, complementary, and explanatory topics. We noted the frequency of references given by the respondents. The findings are presented in Table 2.

**Table 2. Positive and/or negative elements in the in the online learning/teaching experience: Qualitative analysis**

| Parameter | Positive aspects | Negative aspects |
|---|---|---|
| Online lecture<br><br>Video conference by Zoom | Allows repeated hearing, processing of information without pressure and without criticism.<br><br><br><br>**30%** of preservice teachers | Load. It takes a lot of mental strength to listen to online lectures. It is difficult to mobilize forces to listen to a recorded lesson. It's hard to concentrate. A large part of the courses were fully held in zoom, it is very difficult to sit a whole day in front of the computer, there are many noises and distractions.<br><br>**43%** of preservice teachers |
| Asynchronous assignments | Allows learning without pressure, allows deepening of knowledge. Allows time for thinking and understanding. Allows exposure to texts of different types. Exposure to various applications and knowledge sites.<br><br>**40%** of preservice teachers | Load. Stereotypical tasks. Tasks that require a lot of time. Unclear guidelines.<br><br><br><br><br>**17%** of preservice teachers |
| Experience of teaching online and watching online lessons | In some of the lessons there was learning and listening. Students asked questions, listened to their friends. Significant discussions took place. Some of the lessons involved sites that aroused the curiosity of the students. Some of the classes incorporated quality digital teaching units.<br><br>**44%** of preservice teachers | Load. Numerous discipline issues. It is not possible to teach a class through Zoom, perhaps only in small groups. Each student did what he wanted, the children's computers were on, but there was no learning. It is not clear who is responsible for the learning process of the students—school? students? parents?<br><br>**41%** of preservice teachers |
| Presence of the lecturer | Immediate response. Answers to the point. Explanations in a variety of ways.<br><br>**35%** of preservice teachers | Partial response. Partial explanations. No teacher presence was felt, neither in the asynchronous assignments nor in the Zoom sessions.<br><br>**34%** of preservice teachers |
| Learning from home | Maximum utilization of time. Comfortable and familiar environment. Less noise and distraction than in class.<br><br>**69%** of preservice teachers | Difficulty concentrating, difficulty getting into the learning process, lots of stimuli and distractions.<br><br><br>**27%** of preservice teachers |
| SEL, self-awareness, awareness of feelings, desires, needs, behaviors, etc. | Preservice teachers rediscovered traits such as determination, resilience, self-discipline, self-regulation, coping with difficulties, dealing with technological problems, and so on.<br><br>**43%** of preservice teachers | A feeling of helplessness. Unable to concentrate, do not understand instructions and guidelines, difficulty coping with technology, feeling overwhelmed, difficulty mobilizing for learning. Stress, frustration.<br><br>**29%** of preservice teachers |
| SEL, self-management. Flexibility in time management: an array of attributes for regulating, | Time management by preservice teachers, viewing recorded lessons, | Difficulty mobilizing forces to work on assignments. The fact that the recordings and assignments allow for flexibility makes believe that the |

| Parameter | Positive aspects | Negative aspects |
|---|---|---|
| assessing, understanding, managing emotions, and turning information into knowledge that guides and directs a person. | and answering asynchronous tasks, according to each person's schedule.<br><br>**37%** of preservice teachers | tasks can be postponed, therefore the assignments accumulate, creating a sense of overload and difficulty in completing all the tasks.<br><br>**31%** of preservice teachers |
| SEL, social awareness, interaction management, mindfulness, forums, online lectures | Engaging and respectful discourse. Significant and enjoyable dialogues. A place for any student who wants to make his voice heard. Fruitful collaboration between preservice teachers, and between preservice teachers and lecturers.<br><br>Satisfaction with the forums on the course sites and the meetings in Zoom. Mutual aid.<br><br>**63%** of preservice teachers | The forums did not compensate for the difficulty created by the physical distance. No lecturer was present in the forums. Not all courses had forums. Some courses did not have any forums at all, and each preservice teacher had to face the studies alone.<br><br>A sense of social distance, of coping alone with all the clutter and difficulty. A feeling that the online lectures are shallow and insignificant.<br><br>**30%** of preservice teachers |

## EXCERPTS FROM THE PRESERVICE TEACHERS' RESPONSES

### Positive statements

- Requires self-discipline. More accessible and easy to get to every lesson. Recorded lessons really helped me because that way I could watch again, to get the details I missed, and understand them without a problem. I learned to manage my time effectively.

- The content was communicated in an understandable and clear manner. I have lapses of attention, and in face-to-face lessons I lose the flow, whereas these are recorded lectures so that I was able to work on the lesson at my own pace. I have fewer lapses of attention when I work in front of the computer.

- Distance learning allows students to complete lessons, submit assignments, and also to be in continuous contact with the lecturer. There is more time to study the material in depth, and also ask the lecturer all the questions that pop up during the lesson. Mostly there is time for learning.

- Inner peace, less stress, acquiring academic independence, coping with the challenges strengthened my learning skills, willpower, and perseverance. I learned to study on my own, read the material and answered the questions, and learned in this way.

- Time flexibility. Learning pace and level of depth that suits me, overcoming computer phobia. Assistance from friends who were happy to help with the technical aspect. Links to videos and lectures, and plenty of enrichment material. Independent learning.

- Improvement with time. In the beginning there were a lot of glitches and problems that took up a lot of time to solve, but eventually everybody became skilled and the glitches almost disappeared.

- I learned that I have the ability to study independently, to deal with a schedule, and handle many tasks in parallel.

- I got closer to the world of technology and overcame my fears of it. In the past I used only a minimum of technology; today I have the courage to use technology more extensively.

- Collaboration between the students in the forums helped me a lot with understanding the material and made me feel that I'm not alone.

- I felt that in online teaching I was able to arouse the interest and motivation of my students, to mobilize them for independent learning. I felt that I had strengthened my professional abilities and that I could overcome unexpected difficulties.

- The coaching teacher taught on Zoom, and after a brief overview, gave students a link and a task sheet. Then the teacher and myself checked their work in Zoom. He instructed me what to pay attention to, how to write feedback, and so on. The teacher asked me to prepare a lesson to deepen their knowledge on the subject, with the help of the website. When I started the Zoom class, to my surprise, it turned out that a large portion of the students continued their learning after the previous lesson, and in the Zoom class they wanted to have a discussion. There was a very interesting discussion.

- In the school where I had my student teaching practice, there are joint projects for students from Israel and students studying in schools abroad. They learn common topics, through a common website in both languages, forums, with file sharing, and presentations, etc. During the COVID-19 period the students continued to study together. It was very exciting.

## Mixed statements

- At first it was more difficult, but over time I enjoyed the benefits. Still, the live connection with the lecturer and the learning group is lacking.

- Learning during the COVID period showed me how much I can believe in myself, count on myself, and know that even if there are difficulties in distance learning, and sometimes the material is not easy to understand, I can succeed. A desire to try to continue to succeed despite the considerable and great difficulty.

- In my opinion, it is great that we have reached a technological age that may lead to an improvement in the learning experience, but the success of online courses depends on the personality of the lecturer and his ability to design an attractive online course. The difference between the courses was very significant; some of the courses were fun and instructive, and some were a severe punishment.

- The teaching experience was good but challenging. In the lessons I observed that the coaching teacher incorporated parts from a website and then sent the students on site assignments. I also prepared a similar lesson. It went fine, but during the Zoom classes the students communicated with each other, giggled, spoke sign language, and some even talked to their friends out loud. I felt it was less easy to keep track of students' learning progress.

- I watched a Zoom class taught by my coaching teacher. It was okay, she shared a presentation, but then one of the students drew on the presentation, the teacher got upset and started yelling. I saw parents coming, standing behind the students and watching what was happening, watching the teacher as she was shouting. When a teacher shouts in a Zoom class, parents hear and everyone around; it is so different from a teacher shouting in a closed classroom.

## Negative statements

- No... just suffering... A period that is too difficult for me, the difficulty of social distance and the many pressures. It is very difficult to concentrate on Zoom. The stress of everyone watching everybody else is doing me no good and it puts a lot of pressure on me.

- I think it's much harder to learn online. I say this both as a student and as a teacher. Online learning creates inconvenience, misunderstanding between students and lecturers. A lot of things remain unclear.

- Oddly enough, the lecturers have hardly integrated Zoom and asynchronous teaching units. Learning for a whole day on Zoom is very tiring, learning in an environment that is not natural and results in distractions. The social connection during the lessons is missed very much. I just don't accept it... A lecturer speaks and fifty students speak and nothing is understood.

- I watched the teacher's class. The father of one of the students attended the class, sat next to his child, at one point the father started "attending" the class, asking questions, commenting.

- In general, no differences were found between genders, academic year, age of students, and marital status.

## DISCUSSION

The aim of this study was to shed light on the productive, challenging, and thwarting factors that preservice teachers encountered during their studies and in the course of their student teaching during the COVID-19 period, from the perspective of preservice teachers.

Distance learning during the COVID-19 crisis confronted institutions of higher education and the education system with uncertainty, the need for drastic change, and the acquisition of technological as well as learning and teaching skills. The findings reveal the need for teachers and learners of all ages to acquire innovative skills that focus on teaching and learning processes in digital environments. The findings suggest that teachers must stimulate the motivation of learners for independence and perseverance in learning; impart learning skill management and self-efficacy; develop and nurture communication channels; encourage dialogue between teachers and learners, and between learners themselves, through forums, file sharing, and assignments (for example, "collaborative" tasks, tasks with sub-tasks that have a common process connection and end product, and tasks that involve interdependence between groups); promote 21st century skills against the background of social distancing and feelings of stress, frustration, difficulties, and overload; and create a "teacher presence" and a "social presence."

### ONLINE LEARNING IN THE SHADOW OF COVID-19

The transition to online learning was sharp and sweeping. About 35% of students characterized the transition as difficult. The level of students' motivation for learning and coping with difficulties and problems was moderate-high; the level of self-efficacy was moderate.

From the preservice teachers' remarks, it transpired that some of the lessons were in the format of online lectures, mainly through Zoom. Many (43%) had difficulty sitting in front of a computer for many hours. Some (36%) used recordings of the lessons and listened to all or some of the lessons repeatedly, which made it easier for them to understand the lesson. Some preservice teachers (31%) had difficulty with self-regulation and mobilization of strength for learning, and they reported the load accumulating, which caused them feelings of pressure and anxiety. The words that came up most often in open answers were "load" and "stress." Comparing preservice teachers' responses to online lectures and to asynchronous units on the course website—units containing assignments, materials, files, articles, presentations, reference to digital libraries / learning centers / information centers, links to free online databases (such as databases, MOOC), with individual and group assignments on the course website (through file sharing, etc.)—more preservice teachers (43% vs. 17%) complained about online lectures, especially those who claimed that almost all their lessons were online, and fewer preservice teachers complained about asynchronous teaching units on the course website. Some preservice teachers (39%) noted that they had difficulty exposing to all the learning

products in the forums, analyzing the arguments presented in the text, justifying or rejecting them, expressing an opinion and taking a stand in the forums, but over time they understood the contribution of the forums to the learning process. Some preservice teachers (25%) responded that comparing the discourse in online lectures with the (written) discourse in forums for course sites, the discourse in the forums was meaningful, respectful, and dialogical, as opposed to the less significant discourse at online lectures. Some preservice teachers (29%) wrote that comparing courses that had forums and where there was a discussion, with those that did not have either forums or discussion, the forums helped them a great deal, and collaboration with other students made it easier for them. Many preservice teachers (67%) suggested diversifying using technological means, incorporating asynchronous units, and illustrative films, and decreasing the use of online lectures as a substitute for face-to-face lectures. A change of medium from a face-to-face lecture to an online one involves numerous changes in the way in which the lesson is conducted. Researchers (Aboagye et al., 2020; Kapasia et al., 2020) found that during the COVID-19 crisis, forums were not widely used to bridge the psychological gap created by online learning. Researchers (Garrison, 2007; Zilka et al., 2018) noted that the teacher's presence in a face-to-face lecture has different characteristics from that of a teacher in an online lecture. Researchers (Garrison, 2007; Zilka et al., 2018) claim that "lecturer presence," defined as meaningful communication for shaping, assisting, and directing cognitive and social processes, encourages a participatory climate and community social cohesion, and creates social presence. Researchers (Allen & Seaman, 2010; Engstrom et al., 2008; Zilka et al., 2018) define social presence as creating space for collaborative, educational, free discourse, where preservice teachers feel free to express their opinions and needs. They think that social presence enriches the individual and group learning process. The lecturer should create situations that encourage cooperation between the preservice teachers and ask them to respond to others in the forum. Social presence is likely to reduce the psychological-communicative vacuum between preservice teachers in online learning created by their misunderstandings or misconceptions about themselves and the learning process. It can evoke a sense of closeness to counterweigh the isolation, and a sense of a safe place, as opposed to a sense of anonymity (Edwards et al., 2011; Holley & Dobson, 2008). Researchers (DeGennaro, 2008; Gomez et al., 2010; Velasquez et al., 2013) found that in online learning environments, there was more extensive communication than in a face-to-face environment, the forums allowed for dialogue and created a space for distributed cognition—interactions between teachers and learners in meaningful and developed learning processes. Lecturers who encourage the creation of a learning community increase attendance at lessons and social attendance, and reduce employment distance (Edwards et al., 2011; Pittman & Richmond, 2008).

## ONLINE TEACHING EXPERIENCE IN THE SHADOW OF COVID-19

Preservice teachers (41%) wrote that there were discipline issues, and the impression was created that no learning was taking place. It was not clear who was responsible for the learning: the teachers, the students, the parents? In lessons conducted through "conference call" classes such as Zoom, children "played" with each other, walked around their home with the laptop, and talked to family members. Researchers (Riva et al., 2020; Wiederhold, 2020) noted that a synchronous lesson, for example, by means of Zoom, has different characteristics from a face-to-face lesson and emphasized the fact that in a synchronous lesson, orientation in two-dimensional space differs from that in a face-to-face lesson. It is more difficult to locate the sound source and understand the facial expression of the speaker, to understand interpersonal interactions, to make eye contact, to understand messages, and in general, there is difficulty in the perception of people and their space. This is why many learners complain about fatigue, concentration problems, and feelings of overload and of blurred boundaries. Researchers call it "Zoom fatigue" (Riva et al., 2020; Wiederhold, 2020). Researchers (Mulenga & Marban, 2020) found that online learning during the COVID-19 crisis was positive when the learning environment allowed for meaningful learning, guidance of students, and the stimulation of motivation, perseverance, and academic independence. Researchers (Al-Fraihat et al., 2020; European Commission, 2020; Pfefferbaum & North, 2020) found that correct organization of online learning, use

of proper technology, quality of teaching, and communication with learners led to the success of the learning process. This study shows that there is a need to define a clear policy in schools where pre-service teachers have their student teaching practice, regarding the relations between the school, the students, and the parents, and defining the role of the school, the students, and the parents. The change of medium from face-to-face to online learning also changes the learning environment to which all parties have been accustomed. The online space is different from the face-to-face space, and it is impossible to continue to continue acting the same way after the change of medium. The preservice teachers' responses indicate that discipline problems were the result of difficulty concentrating, physical distance, meeting with classmates, workload, and failure to address students' difficulties. Some of the preservice teachers who participated in the study, however, experienced online teaching in schools that previously had engaged in online teaching and learning, and they described effective learning and teaching processes in this environment. A comparison of the preservice teachers' descriptions and findings from this study and previous studies shows that the school must promote each student personally, emotionally, socially, and academically, with the full cooperation of the parents, while maintaining flexible educational regularities. The expression "flexible study regularities" refers to the correct organization of time (such as duration of a Zoom lesson of about twenty minutes to half an hour, taking place at a certain time known in advance; asynchronous computerized units of about half an hour, with flexible timing); schedule flexibility, with asynchronous units that can be worked on in a predetermined but flexible time frame, to allow a sense of "freedom to learn" and to enable families with several children to learn in an optimal digital environment, as opposed to "solutions" that make learning difficult over time, such as learning on a smartphone. A smartphone, with its small keyboard that causes fatigue when typing and its small screen, is liable to widen gaps in learning. It is difficult to process and merge texts on a smartphone. Other factors that determine the user experience stem from the capabilities and limitations of the sensory system and from our basic processing of sensory information. Therefore, changes such as font size and color, background, spacing change, screen size, and keyboard size can lead to drastic changes in the student's learning process and in the quality of the contact with learners (Al-Fraihat et al., 2020; Pfefferbaum & North, 2020; Zilka, 2019a;). The school must ensure the communication flow between the school and the students and between the school and the parents. It is preferable for communication to take place on available digital platforms used by the parents, such as email. If necessary, online conferencing can be set up, synchronously or asynchronously for parent groups and for joint learning groups for teachers and parents. Parents should be encouraged to take part in students' effort to study (Andrew et al., 2020; Huber & Helm, 2020). Each student must have at least one daily synchronous meeting with a teacher or preservice teacher, in groups of 5-10 students. At meetings, it is important to emphasize the mental wellbeing of students, the acquisition of knowledge and skills, and priming for the asynchronous and interactive digital lessons. As needed, the school can hold additional synchronous sessions, beyond the regular ones, according to the students' needs. The teachers should involve preservice teachers in the synchronous sessions, as co-host or as helpers in separate rooms, to mediate between the learners and the study material and to help with technical problems. A "personal tutor" should be assigned to learners who fail to self-motivate for learning, or who have special needs, and use this opportunity to reduce gaps, provide personal attention to each student, and prevent the possible widening of the gaps as a result of the change in the nature of learning (Grewenig et al., 2020; Huber & Helm, 2020). Structural use, mediated by the school, should be made of interactive/digital learning environments produced by professionals, didactic environments recorded in professional studios. Some preservice teachers (17%) indicated that lessons recorded by them or by their guiding teachers in school were at a low level of photography and production, with background noise, so that it was difficult for students to watch these lessons, unlike the professionally produced lessons. Students are used to watching professional film productions and digital lessons, therefore it is difficult for them to watch unprofessional video productions. Learning in a high-quality digital environment is likely to provide a rich learning experience, together with intensive and interactive involvement of students in the learning process, leading to the implementation of the OECD

guidelines (2019a) and to 21st century lifelong learning skills. A change in learning medium also requires a change in the definition of goals and expectations of each party: teachers, students, and parents. All parties must view online learning as empowering and enabling the application of 21st century skills. Researchers (Chen et al., 2020) analyzed articles published between 1976 and 2018, and found that wherever technology was effectively integrated, it dramatically affected the learning and teaching processes. But effectiveness depends on how the technology is applied.

In conclusion, the present study examined the characteristics of online learning during the COVID-19 period. The COVID-19 crisis has been unexpected. On one hand, it disrupted learning in all education frameworks, and on the other, it led to a change in the characteristics of learning that may persist even after the crisis ends. The findings suggest that it is recommended to combine synchronous lectures and meetings with asynchronous learning that integrates 21st century skills. It is advisable to use collaborative tools, such as forums, shared files, and open content repositories, and to encourage meaningful dialogue between learners, and between learners and their teachers, to better deal with the physical distance and with feelings of stress, frustration, difficulties, and overload, and to create lecturer/teacher presence and social presence. It should be remembered that the change of medium—from face-to-face to online learning—changes also the learning environment to which all parties have been accustomed and requires a change in teaching methods.

## RESEARCH LIMITATIONS AND FUTURE STUDIES

This study examined the issue from the perspective of preservice teachers. The issue should also be studied from the perspective of lecturers in academia, teachers in schools, and school students. Future studies should examine whether the change that took place during the COVID-19 period in relation to the deployment of 21st century skills, as experienced by all parties, led to the continued use of these skills in the post-corona period. Continued use depends largely on past experiences, knowledge, skills, and attitudes toward these skills.

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