PROBLEMS
OF EDUCATION
IN THE 21st CENTURY
Vol. 81, No. 3, 2023

STUDY GROUP SIZE, MOTIVATION AND ENGAGEMENT IN THE DIGITAL ERA

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Abstract

This study explored the relationship between the size of the study group and the motivation and engagement of students in online and face-to-face classes while exploring the effect of personal and academic background variables, the number of students in the study group, and the level of their motivation to study. The study included 122 participants, students in their second, third, or fourth year of academic studies, who had experienced online studies during Covid-19 as well as face-to-face studies. They had all participated in both small classes (35 students or less) and large classes (more than 35 students). The study indicates that there is indeed a significant difference in students' motivation and engagement, irrespective of the size of the study group, and the difference in motivation depends on the method of delivery, whether online or traditional (face-to-face). The research results reveal new knowledge regarding online studies and help enrich the literature on this topic, in the context of motivation for online studies and the size of the study group, which are significant causes underlying students' academic success. It is evident from the study that size does not affect motivation, which is solely the student's responsibility. The challenge of academic institutions and lecturers in the digital era is to raise students' motivation and engagement, irrespective of the study group.
Keywords: *covid-19, higher education, engagement of students, e-learning motivation, face-to-face classes*

Introduction

The Impact of Covid-19 on Higher Education in Israel

The Covid-19 pandemic affected Israel's system of higher education. In mid-March 2020 all schools and institutions of higher education were closed and were forced to deal with a new teaching reality, with no prior preparation. The method of education was changed to e-learning as determined by a "temporary injunction". With no time to adjust and no proper preparation, faculty and students were compelled to adapt to the new technologies and new manners of teaching, learning, and evaluation (Donitsa-Schmidt & Ramot, 2020). As a result of the change regarding physical study spaces, students were required to display greater discipline and motivation (Joia & Lorenzo, 2021).

Although e-learning is not a new pedagogic model and has been in use for many years in different domains, there is still a lack of proficiency in implementing e-learning platforms in schools and institutions of higher education (Almusharraf & Khahro, 2020). One of the difficulties that emerged at this stage was the uncertainty as to for how long e-learning would be employed. Only after three weeks of e-learning did it become clear that this manner of teaching would probably persist until the end of the semester, as was indeed the case (Donitsa-Schmidt & Ramot, 2020).

From this stage on it was clear that, in the long term, e-learning would generate changes and force all those involved to adapt on some level, but its implications could not be predicted. The question is whether the effect would be social, influencing only students' "campus experience",

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PROBLEMS
OF EDUCATION
IN THE 21st CENTURY
Vol. 81, No. 3, 2023

or would be in a physical classroom where relationships stem from the real presence of all those involved and have real academic meaning. Does online attendance necessarily mean that students have a lower mental presence? Accordingly, could the sharp transition to e-learning constitute a threat to studies per se? This study attempted to explore the shifts in students' engagement in the transition to e-learning, as associated with class size and motivation. The research literature contains extensive information on the association between class size and students' motivation – and the teaching method, whether face-to-face or e- learning.

Literature Review

Transitions Regarding Face-to-Face and e- learning

According to the US Department of Education, e-learning can be defined as "learning that occurs partially or fully by means of the internet" (US Department of Education, 2010, cited by Tan & Chen, 2021). While online and blended learning were a topic of active research and discussion before the pandemic, its emergence created an immediate need for such means of delivering courses (Tan & Chen, 2021). A paradigmatic change occurred, from a traditional pedagogic method to technology-based teaching and learning. From an era when teachers depended on printed study material or a board and chalk, a transition was evident to a technological era where classrooms are combined with virtual platforms such as Zoom. On these platforms, participants do not have to attend class physically but can study from any distance (Ngogi, 2020). Communication between the lecturer and student takes place through viewing (digital camera), speech and listening (microphone and earphones), and sharing screens for presentations and teamwork. Such usage facilitates lessons that resemble those given in regular classrooms (Meishar-Tal & Levenberg, 2021). This situation gave researchers an opportunity to investigate the pros and cons of e-learning (Tan & Chen, 2021).

Pros and Cons of E-Learning

The outbreak of the pandemic indeed led to a sudden transition from face-to-face to online classes. This generated an opportunity for a potential paradigm change involving the use of educational technologies in both formats (Tan & Chen, 2021). The expansion of distance learning might create the change anticipated by the field of education, slowly breaching the financial and local barriers that blocked equal access to high-standard education for all students, sometimes impassably. E-learning allows students to study at any time and place that suits their study needs. Educators and students attested to their ability to focus more on the content of the course while studying online and less on issues such as parking, traffic, and other problems that might arise when participating in a traditional classroom environment (Gilbert, 2015).

The benefits of integrating online environments include developing autonomous learners, where students make their own inquiries and search for information, evaluate, change, and adapt new skills necessary for millennial learners. Moreover, online learning platforms allow students to approach the study material at their own pace. The literature reports that such an environment helps students develop the ability to manage their time and improve self-efficacy. Specifically, online shared activities have a positive impact on increasing skills such as self-awareness, self-regulation related to the effectiveness and meta-cognition of students, and engagement in class. Then again, the research has identified many critical challenges that might affect learning in an online environment. Such challenges include deficits in different areas such as: evaluations of students' academic integrity, internet access, low quality of delivering e-learning, cost control, individual learning, vocational technological training, access to technology, and technical problems. Other challenges are related to teachers' skills of individual adaptation of lectures

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PROBLEMS
OF EDUCATION
IN THE 21st CENTURY
Vol. 81, No. 3, 2023

to e-learning. They must learn to monitor students' cooperation and to design authentic online evaluation tools that accompany the transition from face-to-face encounters to online platforms (Almusharraf & Khahro, 2020). The Covid-19 crisis threw the faculty into the deep end of the online swimming pool instantaneously, with no preparation. Although most make an effort to try, faculty of a certain age (still most faculty members) lack both the experience and the tolerance to learn new and very unfamiliar methods and technologies. Therefore, e-learning requires different skills, including pedagogic skills, design skills, technical skills, and communication capabilities (Almusharraf & Khahro, 2020). Despite the practical differences in learning between the course formats, a study that compared traditional face-to-face courses and online courses proved that online courses can be as efficient as traditional courses (Dixson, 2015). Another study, however, argues that students fundamentally do not do as well in online courses as in courses held in a face-to-face study environment, because not only does learning in a virtual environment enforce a physical separation between students and lecturers, rather the physical separation also creates a psychological and communication gap (Cung et al., 2018).

E-learning might delay students' academic progress in the absence of high-quality teaching. Almusharraf and Khahro (2020) noted that it is necessary to strictly monitor the choice of online activities, readings, materials, and contribution of the efforts made in order to meet students' expectations and abilities, before their integration into the lesson plan.

A study (Almusharraf & Khahro, 2020) indicated that students' satisfaction rises according to their success in meeting learning goals. This indicates that the participants perceived e-learning platforms as experiential and constructive learning environments. The high satisfaction of the participants might stem from the association with various factors such as the level of support received from the instructors (for example, one-on-one feedback, individual adaptation of studies, personal attention, availability after school hours) or the multi-modal online delivery of the course (for instance audio, video, texts, slides, games, and PowerPoint quiz). Moreover, the educator's method of teaching and support (e-mail, telephone conversations, and virtual encounters) as well as the teaching approaches (for instance active study opportunities, demonstrations, games, group and individual discussion) should also be taken into account. It is also extremely important to relate to the necessary engagement in the course, manifested in an active class versus learning based on listening to lectures (Almusharraf & Khahro, 2020).

Active Learning: Student Engagement in Teaching Processes

Student engagement usually means the degree to which students are actively engaged through thinking, speech, and interaction with the course contents, the rest of the students in the course, and the lecturer. Student engagement is a major component in maintaining a connection between the students and the course, and therefore between them and their learning. Active learning is a general concept that relates to learning methods that actively and independently involve the student in the process of learning and internalizing (Wright et al., 2019). Therefore, the ability to efficiently measure student engagement is essential for researchers and online instructors (Dixson, 2015). Student engagement is generated by active learning techniques, and these are aimed at demanding higher-order thinking tasks such as analysis, synthesis, and evaluation (Wright et al., 2019).

There is a moderately significant correlation between student engagement and the cognitive experience, as well as between the social experience and the general experience. Furthermore, a positive correlation was found between the level of empathy displayed by the lecturers towards the students in class and their engagement in it, such that the higher the lecturer's empathy the higher students' engagement in class (Meishar-Tal & Levenberg, 2021). In an online environment, students' engagement is important for developing academic

PROBLEMS
OF EDUCATION
IN THE 21st CENTURY
Vol. 81, No. 3, 2023

independence. Student activity includes independent inquiry, acclimation to technological changes, acquiring skills, and seeking and evaluating information. The online environment helps students manage their time and acquire a sense of self-efficacy, as well as contributing to the student's engagement in the material and engagement in class (Almusharraf & Khahro, 2020).

Hence, in online learning students were found to be engaged in class to a moderate to high degree, where the main manifestation of their engagement was presence in online lessons, passive listening, and performing the tasks and activities initiated by the lecturers (Meishar-Tal & Levenberg, 2021). However, interpersonal interactions significantly improve students' course performance on all outcome measures. In online courses, holding discussions in forums allows students to take an active part in the learning process. Discussions are a major component in forming a relationship and in experiential learning. These aspects of participation and of peer interaction also contribute to developing critical thinking, reflection, and higher-order thinking.

Students' achievements in online courses can improve significantly given well-structured interpersonal communication, for instance through electronic mail and an individual weekly office hour for answering students' questions. In addition, a correlation was found between the level of active participation in an online forum and students' success in the course. The more messages they wrote about the study material and the more they contributed to discussions of the material, this predicted their final grades (Chung et al., 2018; Parks-Stamm et al., 2017).

Another study that examined student participation in online courses found that active participation by students in discussions on digital forums in online courses is important for learning. In small classes of up to 15 students, lecturer participation in forums increases students' participation, and in medium classes of 15-30 lecturers' participation does not affect students' participation, indicating the significance of the perceived personal connection to students' active learning (Parks-Stamm et al., 2017).

Beyond the discussions and engagement in the study material, another element of active learning is manifested in the presence of the lesson. In e-learning, in some cases students reported that they only turned on the camera occasionally and that they had been busy with other things during class, raising the possibility that they were only physically present in the class but not cognitively (Meishar-Tal & Levenberg, 2021).

It is important to examine intrinsic motivators as components of successful online courses that stimulate students. Self-regulation and motivation have been identified as two critical factors for determining success in online courses. Self-regulation can be defined as "students' ability to plan, monitor, and evaluate their behavior, cognitive, and learning strategies" (Meishar-Tal & Levenberg, 2021). Students with high self-regulation used time management frequently, reviewed the material regularly, sought the help of professors or peers, were punctual, and had the meta-cognitive capacity to reflect on their learning. Students who did not regulate themselves tended to display academic procrastination, increased disorganization, and made less use of cognitive and meta-cognitive strategies to achieve their learning goals (Gilbert, 2015). According to Gilbert (2015), maintaining motivation in an online course is a challenge for many students.

Motivation

Motivation is defined as the total of all factors that cause one to take action. Classically, motivation is divided into two concepts: Intrinsic motivation relates to actions performed "for the act itself" or for the interest and pleasure that it contains. Extrinsic motivation includes behaviors performed for reasons other than the satisfaction of performing them (Ryan & Deci, 2020).

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PROBLEMS
OF EDUCATION
IN THE 21st CENTURY
Vol. 81, No. 3, 2023

There is widespread research agreement that motivation is one of the crucial factors that affect academic success (Smart & Cappel, 2006). The definition of academic success contains up to six components: academic achievements (manifested in one's grades), satisfaction, acquiring skills and capabilities, perseverance, achieving learning goals, and success in one's career (York et al., 2015). Intrinsic motivation is consistently connected to high academic functioning and leads to a better-established foundation for achievements. This is a diverse and complex issue as it changes individually (Ryan & Deci, 2020).

Motivation has been defined as one of the key factors that affect academic achievements. It has also been argued that higher motivation will lead to an outcome of making greater efforts for one's studies and has been associated with how students relate to and approach the fulfillment of challenging tasks (Bandiera et al., 2010; Madlan & Richards, 2016; Micari & Pazos, 2012). Gilbert (2015) further says that students who show a lack of motivation, whether intrinsic or extrinsic, might easily forget the initial goal of their academic studies, get lost in the process, and finally even leave. Among the important factors that affect students' motivation are students' interest in the studied contents, as well as the perceived relevance of the course, or in other words, is it interesting and is the studied material perceived as meaningful for their future work life? If the students see that they will benefit from the course contents, their motivation to study will probably grow (Smart & Cappel, 2006).

Madlan and Richards (2016) described a positive motivational circle, where motivation is driven by personal and social needs. The initial motivation to study in order to earn grades is expected to lead to social learning, which in turn leads to motivation for socialization (creating social ties). Socialization encourages motivation to learn, and they reinforce each other.

Another meaningful aspect related to building motivation in one's studies is the personal relationship and interest expressed by the lecturer. Engagement in studies, interaction, cooperation, and interpersonal communication have been identified as meaningful components for academic success and their existence leads to motivation to learn, even in courses considered particularly difficult. Academic cooperation creates a motivational incentive that leads to higher grades as well as to motivation by virtue of the interaction (Bandiera et al., 2010; Madlan & Richards, 2016; Micari & Pazos, 2012).

Class Size

Another factor that might contribute to students' participation in online discussions is the class size (Parks-Stamm et al., 2017). According to Wilson (2002), the concept of class size relates to "the total number of students allocated to a teacher for all or part of his teaching schedule" (Parks-Stamm et al., 2017). In other words, class size is the number of students in a given class with a teacher. Following this definition, several studies tried to determine the ideal number of students in large and small classes (Almulla, 2015).

For many years, class size was the focus of disputes and intensive investigations. A considerable part of the debate regarding class size was the question of whether reducing the number of students in a class has a positive effect on students' achievements. An interesting feature of the discussion on class size is the well-established contradiction between the view of most teachers, teacher assistants, parents, and some of the researchers, who feel that small classes are beneficial for teaching and learning, and the alternate view usually advocated by economists, policymakers, and think teams, whereby small classes have no significance for the quality of learning (Blatchford & Russell, 2019). Large classes are usually identified with noise, crowding, and heterogeneity, while small classes might be perceived as an extended version of a private lesson, where each student receives personally adapted individual attention (Shafrir et al., 2016).

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PROBLEMS
OF EDUCATION
IN THE 21st CENTURY
Vol. 81, No. 3, 2023

Studies on the effects of class size in high school examined a wide variety of outcomes, including achievements, student engagement, attitude, and student evaluations of teaching. The research literature consistently supports the concept whereby students perceive an improved learning experience when class size is diminished. For example, students tend to allocate higher ratings to instructors and courses when the class size is smaller. Moreover, students in small classes report high learning output, engagement, and a more positive approach to discipline. The suggested reasons for this greater engagement include pedagogy, where instructors in small classes use more active study approaches, and personal adaptation, where students receive more personal attention in small contexts. A study conducted at a medium-sized British polytechnic confirms these findings. The researchers discovered that students in large first-year introductory courses experienced feelings of anonymity and lack of desire to speak or ask questions. Similarly, instructors reported difficulty forming relationships with students in large classes (Wright et al., 2019).

Students in "large" classes (defined by Parks-Stamm et al. as more than 34 students) participate less in class than those in medium or small groups, but the ideal class size in the small-medium range is debatable. Larger groups afford more interaction between students. However larger online discussions might cause "information overload", reduced teacher-student interaction, or a reflection of psychological barriers to participation in traditional lessons (for instance, shyness). Some claim that the quality of feedback the instructor provides to students might be reduced in large classes and that the lecturer's overall performance is perceived as diminished, which might lead to a general drop in the course quality (Parks-Stamm et al., 2017; Sorensen, 2015).

In addition, the Jewish approach, following Maimonides, is that a teacher can teach only up to 25 students and if there are more students an assistant teacher must be added. Class size is an issue that must be addressed particularly in the context of online studies. The main benefit of this form of study seems to be that a larger number of students can be taught in one classroom since virtual space is unlimited (Sorensen, 2015).

Student Engagement

Student engagement in class has an important impact on their achievements and learning process. Responsibility for student engagement in learning is divided to a large degree between the students themselves and the teaching staff. But while the student must display willingness and effort to be engaged and active, teachers must provide the conditions for the learning process and generate situations that arouse engagement (Kahu & Nelson, 2018). The significance of students' engagement in online courses is no different in this context than when studying in a physical classroom, but it is more challenging due to the special conditions of both students and lecturers (Park & Kim, 2020). The distance between students and lecturers and among students themselves requires a special effort to form an interaction between the lecturer and students and among students. Bollinger and Martin (2018) examined the significance that students ascribe to different strategies of generating student engagement in online classes. They discovered that students highly appreciate lecturers' efforts to maintain communication and contact with the students, as well as to respond quickly and provide feedback, and their contribution to students' engagement in online courses, but are less appreciative of attempts to involve them in active and collaborative learning in class and at home. These findings are compatible with the findings of previous studies on student attitudes to active learning and collaborative learning, which indicate that students who switch to online learning prefer to preserve the traditional face-to-face model of learning based on delivering information from the lecturer to the students and are less satisfied with attempts to integrate other teaching strategies (Selwyn, 2011; Smith & Cardaciotto, 2011; Wong & Fong, 2014).

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PROBLEMS
OF EDUCATION
IN THE 21st CENTURY
Vol. 81, No. 3, 2023

Rationale

This study explored the relationship between the size of the study group and the motivation and engagement of students studying online or face-to-face while inspecting the effect of personal and academic background variables, the number of students in the study group, and their motivation to learn.

Research Questions

1. Do personal (gender and age) and academic (year of studies and discipline) background measures affect students' degree of engagement and their motivation when studying face-to-face or online, and to what extent?
2. Does the number of students in the study group affect students' engagement and motivation, when studying face-to-face or online, and to what extent?

Research Methodology

The study is a quantitative study based on questionnaires distributed on digital media to students in their second, third, or fourth year of studies in Israeli universities who had studied in both face-to-face and e-learning methods. The study was conducted during the 2021-2022 school year, and it focused on a case study of a university in Israel that is typical of Israeli research universities, which engage in research and academic teaching.

Research Sample

The research participants were 122 students in their second, third, or fourth year of studies or subsequently at institutions of higher education in Israel, who had experienced e-learning studies during Covid-19 and also had experience with face-to-face studies. During the Covid-19 and lockdown period, the universities taught via e-learning by Zoom. After this period, for reasons of student convenience and their demand to continue video recording the lessons and to require less physical attendance while allowing them to study at least one or two days a week via e-learning, the universities consented to this demand.

All participants completed an informed consent form (which confirms that participants understand their rights, accept the conditions of the study, and are participating willingly in the study) before proceeding to complete the questionnaires. They all took part in small classes (up to 35 students) and in large classes (more than 35 students). Of these, 89 were women (73%) and 33 were men (27%), aged 20-58 (M = 25.51, SD = 5.59). About half the students were in their second year of studies (48.4%), 45.9% in their third year, and the remainder in their fourth year (5.7%). Most were studying behavior sciences and psychology or engineering and computer studies (61.5%). The respondents were located by convenience sampling. Some of the respondents were located based on previous acquaintance with the researchers and the rest through social networks (Facebook, Instagram).

Tools

The research tools included five questionnaires that were distributed to the students:

1. **Questionnaire on personal information** – developed for the current study and including personal information on the respondents. The information included: gender (female/male), age (in years), year of studies, and study discipline.

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PROBLEMS
OF EDUCATION
IN THE 21st CENTURY
Vol. 81, No. 3, 2023

2. **Questionnaire on engagement** – taken from the article "The impact of students' active participation and lecturers' performance on students' learning experience of students during the Covid-19 outbreak" (Meishar-Tal & Levenberg, 2021). The purpose of the questionnaire was to measure students' level of active engagement in class. The questionnaire consists of 8 statements, for example: "My attendance of online lessons is greater than my attendance of face-to-face classes". Respondents were requested to answer on a scale ranging from 1=not at all, to 5=very much. Items 4 and 6 were reversed. The final score was calculated by summing all item scores, where the possible overall score ranged from 8-40. A high score attests to higher engagement in online studies than in face-to-face studies. All statements aside from 4 and 6 were reformulated by the researchers in order to adapt the questionnaire to the study and relate to the two manners of delivery. Cronbach's alpha reliability of the questionnaire was 0.79.
3. **Questionnaire on class size** – developed by the current researchers due to the lack of precise questionnaires on this domain in the research literature. The questionnaire relates to class size (a small class is defined as one that contains up to 35 students and a large class of more than 35 students). The purpose of the questionnaire is to examine the student's engagement relative to the class size and manner of teaching. It included 4 items, for example: "I am more meticulous about attending lectures in a larger class than in a small class". The participants were asked to respond on a scale ranging from 1=not at all, to 5=very much. Item 2 was reversed. Participants were asked to complete this questionnaire twice – once for face-to-face studies and a second time for online studies. The score for the questionnaire was comprised of the sum of all responses (range 5-20). A higher score indicates greater engagement in a large class than in a small class. Cronbach's alpha reliability of the questionnaire was 0.74 for the face-to-face class and .68 for the online class.
4. **Questionnaire on engagement, manner of delivery (face-to-face/online), motivation, student-faculty relationship** – developed by Prof. Nitza Davidovitch. The questionnaire includes 11 items. The participants were asked to respond on a 5-point scale ranging from 1=not at all, to 5=very much. For example: "When teaching in a face-to-face class the lecturer is more attentive to students than in an online class". The final score is comprised of the sum of all responses (range 4-16). A high score attests to a better relationship of the lecturer with the students in face-to-face learning than in online learning. Cronbach's alpha reliability of the questionnaire was .81.
5. **Questionnaire on motivation** (Motivated Strategies for Learning Questionnaire – MSLQ) – five questions that were appropriate for the research needs were utilized. The questionnaire consists of 5 items, for example: "I have great interest in the content field taught in this course". The participants were asked to respond on a 5-point scale ranging from 1=not true at all, to 5=very true. The total score on the questionnaire is comprised of the sum of all items (range 5-25). A high score indicates high motivation to learn and a low score low motivation to learn. Cronbach's alpha reliability of the questionnaire was 0.86 for face-to-face studies and 0.79 for online studies.

Procedure

The respondents were asked to read and sign an informed consent form to participate in the study and then answer the questionnaire. The participant received, by e-mail, WhatsApp, or social networks, a link to an explanation and to the research questionnaire, prepared through Google Docs. The link was sent to them personally. The participants were told that after

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PROBLEMS
OF EDUCATION
IN THE 21st CENTURY
Vol. 81, No. 3, 2023

completing the questionnaire the data would automatically be transferred to the researchers, with no identifying details. In this method of distribution, most questionnaires arrived fully completed. The order of the questionnaires completed by participants in the study was constant, as follows: personal information, engagement, class size, student-faculty relationship, and motivation.

Data Analysis

As reported by the participants, completion of the questionnaire took about 15 minutes. After the data were collected, the questionnaires were processed using the SPSS program. Means and standard deviations for class size, student-faculty relationship, and motivation by type of studies were calculated to study distributions of research variables. Then, associations between research and background variables were studied by Spearman rank correlations. To answer the research questions, the correlations between the research variables were examined by Pearson correlations.

Research Results

Correlations Between the Research Variables

Table 1 below presents the correlations between the research variables.

Table 1
Pearson Correlations Between Engagement, Class Size, Student-faculty Relationship, and Motivation (n=122)

	Class size face-to-face	Class size online	Student-faculty relationship	Engagement in class	Motivation face-to-face
Class size face-to-face					
Class size online	**46.				
Student-faculty relationship	02.	11.			
Engagement in class	08.-	05.	**36.-		
Motivation face-to-face	14.	13.	**27.	02.	
Motivation online	17.	**31.	*20.	09.	**79

*$p < .05$, **$p < .01$

It is clear from the table that there is a significant positive correlation between student engagement in an online class by class size and their motivation in an online class ($r = .31$, $p < .01$). In addition, a significant positive correlation was found between student-faculty relationship and motivation in a face-to-face class ($r = .27$, $p < .01$) and motivation in an online class ($r = .20$, $p < .05$) and a significant negative correlation with engagement in class ($r = -.36$, $p < .01$).

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PROBLEMS
OF EDUCATION
IN THE 21st CENTURY
Vol. 81, No. 3, 2023

Correlations Between the Background Variables and the Research Variables

The dependences between variables (background and research variables)

were scored by Spearman correlations. Statistical differences of these correlations were estimated based on Student's distribution (t-test). The results showed a significant correlation between age and engagement ($r = .20$, $p < .05$), such that the older the student the greater the engagement in online studies rather that in face-to-face studies.

The two research questions asked whether there is a difference in students' engagement in learning in an online course versus in face-to-face studies, by class size, motivation, and student-faculty relationship. To explore this, analyses of variance with repeated measures were conducted, with age being the controlled variable. Table 2 below presents the means, standard deviations, and different results of the analysis.

Table 2

Means and Standard Deviations for Class Size, Student-Faculty Relationship, and Motivation, by Type of Studies

	Face-to-face studies		Online studies		
	M	*SD*	*M*	*SD*	*F*
Class size	8.63	3.50	7.42	2.30	1.57
Motivation	20.12	4.13	16.12	3.76	**9.59
Student-faculty relationship	18.52	6.09	13.71	4.03	99.

*$p < .05$, **$p < .01$

It is evident from the research findings that:

- There is a significant difference in the motivation of students between face-to-face and online learning, $F(1,120) = 9.59$, $p < .01$. Namely, students' motivation to learn is higher in face-to-face learning than in online learning.
- There is no difference in students' engagement between face-to-face and online learning by class size, $F(1,120) = 1.57$, n.s.
- There is no difference in students' engagement between face-to-face and online learning by student-faculty relationship, $F(1,120) = .99$.

Discussion

The current research attempted to examine students' engagement and their motivation to learn with the two teaching tools (e-learning/face-to-face) as affected by class size and students' level of motivation and engagement. The research literature indicates a possible difference in the perception of students' engagement as well as in the levels of motivation and student-faculty relationship as affected by class size and how the class is delivered, where students' engagement usually improves with the decline in class size. This is also true of motivation (Parks-Stamm et al., 2017; Sorensen, 2015; Wright et al., 2019).

The research findings uncovered a significant difference in motivation as affected by how the lesson is delivered. In face-to-face lessons students reported more than in e-learning lessons. No statistical difference was found in students' engagement in the two manners of delivery as affected by class size. The issue of motivation to study in the two delivery methods is meaningful with regard to the future method of studies in the context of e-learning, studies,

PROBLEMS
OF EDUCATION
IN THE 21st CENTURY
Vol. 81, No. 3, 2023

as motivation is important for students' success in their academic studies (Davidovitch & Wadmany, 2021; Smart & Cappel, 2006).

The research findings reveal new knowledge on e-learning studies and help enrich the literature on this topic regarding the issue of motivation in e-learning studies and the size of the study group, which are meaningful factors for students' success in their academic studies. It is evident from the study that the size does not affect motivation, which is solely the student's responsibility. The challenge of academic institutions and lecturers in the digital era is to raise students' motivation and engagement, irrespective of the study group.

Digital learning might attract a large number of students to these courses. This reduces the costs of the academic institution, which will open large courses in the name of progress and innovation. But what about pedagogic considerations? What happens to students with different backgrounds and motivation? Centers for the promotion of teaching and learning at academic institutions are charged with preparing for strengthening the pedagogy of developing and using digital courses, as well as preparing teams of teacher assistants who will provide further support to small work groups. Even in large courses it is necessary to develop channels for human contact and interpersonal interaction with the students. Caution should be taken to avoid capitalist tendencies of commercializing courses, stressing profits at the expense of high standard learning that will nurture contemporary learners who live in a world of the revolution of tools without losing the human side of our life.

Conclusion and Implications

This study explored the association between the size of the study group and the motivation and engagement of students studying online or face-to-face, while examining the influence of personal and academic background variables, the number of students in the study group, and their level of motivation to study. The study indicates that there is indeed a significant difference in students' motivation and engagement, irrespective of the size of the study group, and the difference in motivation depends on how the class is delivered, whether online or in a traditional face-to-face mode.

No difference was found in students' engagement between face-to-face and online learning by class size. This can be explained by several reasons: First, it is evident from the research literature that there is a lack of information regarding the issue of online studies in general. The research literature established that students' engagement rises with the decline in class size, but this literature addresses face-to-face classes only. No empirical research has been conducted on student engagement as affected by class size in online lessons.

It is evident from the research findings that a significant difference was found in students' motivation between face-to-face and online learning, such that the motivation of students to learn is higher in face-to-face studies than in online studies. Low levels of motivation may have been found in online learning for reasons that are unrelated to the type of teaching but rather to the period in which it was experienced. Online studies among the students in the current study began during Covid-19, a complex and uncertain period that strongly affected people's mental state throughout the world.

Declaration of Interest

The authors declare no competing interest.

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PROBLEMS
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