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The Effects of Online Learning Experience During the COVID-19 Pandemic on Students' Satisfaction, Adjustment, Performance, and Loyalty

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ABSTRACT

This research investigates the student online learning experience (SOLE) during the 2020 spring COVID-19 pandemic. We collected quantitative data through an online survey from 362 international students and 488 domestic students at a large Polish University. Correlation and path analysis within a conceptual model of SOLE and its academic outcomes established that (1) SOLE explained adjustment, performance, satisfaction, and loyalty; (2) academic adjustment predicted performance, satisfaction, and loyalty; (3) academic performance and

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satisfaction predicted student loyalty; and (4) academic performance predicted satisfaction. Interestingly, time spent in quarantine/self-isolation did not exert any effect on academic outcomes in SOLE. Moreover, qualitative data collected via narrative interviews with 13 students (11 international and 2 domestic) developed our understanding of SOLE and its outcomes. We propose some research and practice implications for universities to enhance SOLE.

Keywords: academic adjustment, academic performance, Covid-19, international students, online learning, student satisfaction, university support

INTRODUCTION

The COVID-19 outbreak pushed governments toward introducing lockdown restrictions, such as social distancing and self-isolation, aimed at tackling the spread of the virus (Bretas & Alon, 2020). Studies point out the negative outcomes of the lockdown, social distancing measures, and concentrated self-isolation, such as not only devastating economic, political, and social disruption (Bretas & Alon, 2020; Nicola et al., 2020), but also educational (Fischer, 2020) disruption. More than one year into the pandemic, almost half of the world's students at primary, secondary, and tertiary levels have been affected by full or partial closures of educational institutions (The United Nations Educational, Scientific and Cultural Organization [UNESCO], 2020) whose activities have been forced into a remote learning mode. Unlike prior experiences of remote learning, which were generally planned and designed as a deliberate feature of certain programs of study, pandemic-era students were obliged to switch from the face-to-face learning mode to the online learning mode suddenly and with little preparation.

Research has suggested that the effectiveness of online learning and face-to-face traditional courses may be measured equally (Sitzmann et al., 2006; Verduin & Clark, 1991) provided that the course design and methods are appropriately adapted to the technology (Rovai, 2003) and instructional tasks, and that courses ensure student–student and teacher–student interactions in online learning (Verduin & Clark, 1991). Nevertheless, students generally exhibit significant dissatisfaction with remote education during the COVID-19 pandemic (de Haas et al., 2020), as they miss the interactional and social aspects of their academic experience. The adverse effects of the missing interactions are confirmed in teachers' perception of their students' emotional and academic difficulties experienced in the online learning during the pandemic (Jelińska & Paradowski, 2021). Further, some students face problems with a poor Internet connection in some locations and an unfavorable study environment in the household (Kapasiaa et al., 2020).

Recent studies call for exploratory research into the effects of university closures on students (Fischer, 2020; Nicola et al., 2020). Besides the social and emotional disruptions caused by the social isolation, switching to the remote learning mode entails a challenging experience of studying and interacting with peers and teachers (Jelińska & Paradowski, 2021). The quality of this experience

and satisfaction with university services may determine students' loyalty, that is, the intention to persist with the program of study (van Rooij et al., 2018), and decision making about future options. Such options include returning to the home country in case of international students (Cao & Chieu, 2021; Fischer, 2020), that is, students who have crossed national borders for the purpose of study (Organisation for Economic Co-operation and Development [OECD], 2013). Indeed, reports have shown a pandemic-related decline in persistence and retention among international and domestic students (National Student Clearinghouse Research Center [NSCRC], 2021). Thus, it is relevant to explore the student online learning experience (henceforth SOLE) during the pandemic to better support students in the process.

This article investigates SOLE and its academic outcomes during the 2020 spring coronavirus pandemic among domestic and international students at a large Polish university (henceforth Polish University); most teaching activities were switched to online mode in mid-March, 2020. We will seek to answer the following research questions (RQs):

RQ1: What were the relationships between various aspects of the pandemic SOLE and students' academic adjustment, satisfaction, performance, and loyalty?

RQ2: What sense did the students make of their experience?

The paper will continue with a theoretical framework that will develop the hypothesized relationships between the variables, which are then tested by two empirical studies. To answer RQ1, Study A will test a hypothetical model of the effects of SOLE on academic outcomes by using data collected from students through an online questionnaire survey. To answer RQ2, Study B will explore how students understood their experience by using narrative interview data. After a discussion of the results, conclusions, limitations, and implications will be drawn.

LITERATURE REVIEW

SOLE

The pandemic-imposed abrupt transition to online learning has been psychologically and educationally challenging for students due to a radical change of the learning environment and the means of class attendance and interactions with other students and faculty. *Student online learning experience* (SOLE) is defined as a student's personal experience of various aspects of online learning that impacts their achievement and psychological/emotional comfort (i.e., satisfaction) with online learning as a method of education.

Research on student academic experience and online learning models recognizes the importance of student–student, student–content (including technologies and pedagogical tools), student–teacher (Marks et al., 2016), and student–university interactions (Pascarella & Terenzini, 1980, 2005) in shaping

academic experience, persistence, and dropout decisions. Based on those theoretical considerations and our informal talks with teachers and students during the first two months (March and April 2020) of the transition to online learning at Polish University, followed by our pilot online survey in May 2020 aiming at exploring SOLE of 120 Polish University international and domestic students, we have established four major aspects of SOLE in the pandemic-related context:

1. *Interactions with students*—which contribute to students' academic achievement (Broadbent & Poon, 2015), perceived learning, and satisfaction (Marks et al., 2016), where *student satisfaction* is defined as their assessment of services provided by the university (Wiers-Jenssen et al., 2002). Such interactions may also be perceived as a support structure compensating for socialization deficits during the pandemic (Commodari & La Rosa, 2020).

2. *Students' technical capacity to participate in online learning*—which conditions the degree to which students will enjoy the benefits of the university's educational offer (Gibson, 1998; Johnson et al., 2009) and how fast and effectively they will adjust to online learning, especially during the pandemic-induced transition to online learning. Students with prior technical experience with online learning feel more comfortable with online courses (Jones & Wolf, 2001), which should increase their satisfaction, although some research has found no empirical support for this impact (Marks et al., 2016).

3. *Organization of online learning*—this includes online programs, courses, cultural initiatives, and support offered by the university, which contribute to students' success (Harms et al., 2006). Empirical research has confirmed the positive impact of certain elements of student-content interaction (e.g., online group projects) on students' satisfaction (Marks et al., 2016).

4. *Interactions with teachers*—which determine students' academic development (Al-Harthi, 2005) and influence students' perceived learning and satisfaction (Marks et al., 2016). Interactions with teachers serve as a support structure in pre-pandemic (MacDonald & Thompson, 2005) and pandemic learning (Jelińska & Paradowski, 2021).

The conceptualization of SOLE cited earlier and its impact on students' academic success leads to formulating the following hypotheses:

Hypotheses 1a-d: SOLE predicts (1a) academic performance, (1b) adjustment, (1c) student satisfaction, and (1d) loyalty.

Academic Outcomes of the Pandemic SOLE

Academic Adjustment as Predictor of Academic Success

Lowe and Cook (2003) have found that about a third of first-year university students drop out of the university due to difficulty transitioning into university life. A student's success exceeds their scholarly potential and is considerably dependent on their adjustment to the challenges of their student life (Gerdes & Mallinckrodt, 1994). *Adjustment* refers to an individual's affective psychological response to a new context, which is defined by how much they fit in and how comfortable they feel in that context (Black et al., 1991). In a similar vein, *academic adjustment* will be defined as the degree to which a student fits in the academic context of studying in the university and how comfortable they feel in that context. It is the result of a student's interaction with academic expectations and the university's demands (Poyrazli et al., 2001; van Rooij et al., 2018).

Prior research has linked academic adjustment with student performance, satisfaction (Rienties et al., 2012; van Rooij et al., 2018), and loyalty, although loyalty is best explained by satisfaction (van Rooij et al., 2018). Academic adjustment is, thus, hypothesized to affect students' academic success in the pandemic SOLE.

Hypotheses 2a-c: Academic adjustment predicts (2a) academic performance, (2b) student satisfaction, and (2c) loyalty.

Student Satisfaction, Performance, and Loyalty

Student satisfaction models link various antecedents and factors; among others are the image of the university, meeting students' expectations (to academic and non-academic services), the perceived value (of service quality relative to the price paid), and loyalty (Dib & Alnazer, 2013; Turkyilmaz et al., 2018). As student satisfaction has been linked with academic performance (Suhre et al., 2006; van Rooij et al., 2018), these variables are hypothesized to be also related in the pandemic SOLE:

Hypothesis 3: Academic performance predicts student satisfaction.

Moreover, satisfaction has been linked with achievement and loyalty (Chandra et al., 2018; Suhre et al., 2006; Turkyilmaz et al., 2018; van Rooij et al., 2018), which leads to:

Hypotheses 4a-b: (4a) Academic performance and (4b) student satisfaction predict student loyalty.

Because of the different nature of the academic experience of international and domestic students (language and cultural challenges, different forms of support or

levels of understanding of the educational model in the host country), it was relevant to test the conceptual model (Figure 1) in those two groups of students.
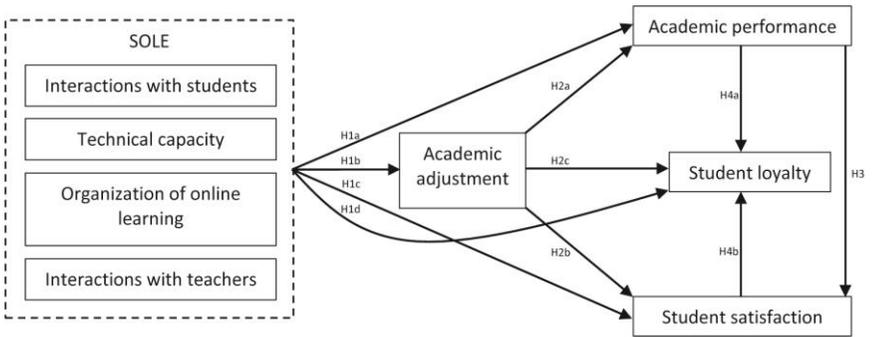

Figure 1: Conceptual Model and Hypotheses.

RESEARCH DESIGN

We used a sequential mixed-method approach to answer RQ1 and RQ2 through, respectively, a quantitative Study A and qualitative Study B. Study A aimed at establishing relationships between SOLE and academic outcomes by testing the conceptual model (see Figure 1). Study B aimed at understanding those relationships through an analysis of students' experiential narratives.

STUDY A

Method

Participants

The sample includes 362 international students and 488 domestic students from Polish University. International students originated from 62 countries, with the majority coming from Ukraine (21.8%), Belarus (18.7%), China (5.5%), Spain (5.5%), Italy (5%), Turkey (4.2%), Russia (2.9%), and France (2.4%). Both international and domestic samples are heterogenous as they involve students of different types and programs, and those who stayed in quarantine/self-isolation and participated in online learning from Poland and abroad (see Table 1). This allowed for the collection of data from students with a broad range of academic experience.

Table 1: Background of the Sub-samples ($N = 850$)

Background variables	International students	Domestic students
Age	$M = 22.88$ ($SD = 4.95$)	$M = 23.34$ ($SD = 4.93$)
Gender		

Background variables	International students	Domestic students
Male	31.8%	20.5%
Female	67.7%	78.7%
Other	0.5%	0.8%
Type of student		
Long-term	78.7%	99.2%
Short-term (e.g., Erasmus)	21.3%	0.8%
Program[a]		
BA	60.8%	72.5%
MA	32.3%	22.3%
Doctoral	5.5%	6.1%
Other	2.2%	0.4%
Quarantine/self-isolation		
Yes	61.0%	44.5%
No	39.0%	55.5%
Country of current residence		
Poland	66.3%	97.1%
Outside of Poland	33.7%	2.9%

[a] Percentage totals for program are higher than 100%, as some students attended different programs at the same time.

Measures

SOLE Participants completed a Student Online Learning Experience (SOLE-S) scale, developed for the purpose of this research due to the lack of relevant instruments measuring SOLE. It includes 12 items rated on a 7-point scale (1 = strongly disagree, 7 = strongly agree), which measures four aspects (three items per subscale) of SOLE: (1) *interactions with students* (e.g., "My communication with other students has had a positive effect on my online learning experience"); (2) *technical capacity* to participate in online learning (e.g., "I have enough technical ability to participate in online classes/lectures"); (3) perceived *organization of online learning* (e.g., "My university organizes online learning well"); and (4) *interactions with teachers* (e.g., "I find my teachers supportive in my online learning").

For all the 12 items, the correlation matrix determinant was .01; Kaiser-Meyer-Olkin index: .846; Bartlett's significance test of sphericity: $\chi^2(66) = 1194.47$, $p < .001$. The statistics cited earlier justify searching for common factors. To validate SOLE-S, we conducted confirmatory factor analysis (CFA) on a sample of 256 international students from Polish University. The estimated model

fits were satisfactory: $\chi^2(48) = 77.59$, $p = .004$; CFI = .974, RMSEA = .048 (CI90 [.027;.067]), SRMR = .036. All factor loadings of items in a measurement model were statistically significant. Next, we measured discriminant validity by comparing the average variance extracted (AVE) values with the squared correlations between paired constructs. The AVE values did not exceed the squared correlations between Factor 3 (organization of online learning) and Factor 4 (interactions with teachers). The correlation between these two factors was .92, which indicates that they measure the same phenomenon and, hence, potentially constitute a common factor. To test this hypothesis, we examined the validity of the three-factor model in which items from Factors 3 and 4 comprise one factor labeled "organization of online learning/interactions with teachers." CFA showed that the three-factor model fits the data well: $\chi^2(51) = 93.24$, $p < .001$; CFI = .963, RMSEA = .056 (CI90 [.038;.074]), SRMR = .041. All AVE values exceeded the squared correlations for each pair of factors. Overall, these values indicate that discriminant validity was achieved. Absolute values of factor loadings for Factor 1 ranged between .58 and .83, for Factor 2 between –.56 and .78, and for Factor 3 (comprising six items) between –.64 and .78. The inter-item correlation ranged between .28 and .52.

In view of what has been stated earlier, instead of measuring the conceptualized four factors of SOLE, we decided to merge the overlapping factors and measure SOLE composed of three distinct factors: (1) interactions with students (α = .74/.72 for English/Polish version); (2) capacity to participate in online learning (α = .72/.65 for English/Polish version); and (3) organization of online learning/interactions with teachers (α = .81/.75 for English/Polish version).

SOLE Outcomes SOLE outcomes included student satisfaction, adjustment, performance, and loyalty measured by using scales from Wilczewski et al. (2021). Their content, face, and response process validity were assessed by two researchers who verified, through interviews, whether students understood the questions in line with their expected content; selected questions covering various aspects of the construct measured; as well as selected questions that best expressed the constructs measured through a pilot online survey.

Student Satisfaction. Participants rated six items expressing satisfaction with (1) general academic experience, (2) studying at the university during the pandemic, (3) studying conditions, (4) online learning, (5) self-perceived scholarly development, and (6) achievement in online learning, by using a 7-point scale (1 = strongly disagree, 7 = strongly agree). An exemplary item was: "I am satisfied with my academic experience in this university." Those components constituted a one-factor scale (α = .83/.82 for English/Polish version).

Academic Adjustment. Participants rated adjustment to five aspects of the university: (1) teaching methods, (2) student assessment methods, (3) expectations that the university teachers have of [them], (4) studying conditions, and (5) online learning, by using a 7-point scale (1 = very unadjusted, 7 = very adjusted). The scale yielded a one-factor structure (α = .83 for English/Polish version).

Academic Performance. Self-perceived academic performance in online learning as compared with the pre-pandemic experience in stationary learning was measured with one direct item: "My academic performance is better in online learning than before the COVID-19 pandemic." It was assessed on a 7-point scale (1 = disagree strongly, 7 = agree strongly).

Student loyalty. Similar to prior studies that used one-item scales for measuring students' intention to persist (van Rooij et al., 2018), student loyalty was measured with one direct item: "I would not recommend online learning experience in this university to other students." It was assessed on a 7-point scale (1 = disagree strongly, 7 = agree strongly), which was reverse coded.

Control Variables

The study controlled for the *time in quarantine/self-isolation* (in weeks) to determine the effect of this variable on SOLE and academic outcomes.

Procedure

We collected self-report data from international and domestic students from Polish University through an anonymous online questionnaire survey approved by Rector's Committee for Ethics of Research with Human Participants at Polish University (no. 60/2020). We recruited international students through an e-mail invitation sent out from the university's office for international students, whereas offices for student affairs distributed the invitation among domestic students. Participation was voluntary with no remuneration. After giving written consent, participants completed the survey over the span of 10 days at the turn of May and June 2020 during the lockdown period in Poland. The survey lasted approximately 15 min.

Data Analysis

We calculated Pearson's correlation coefficients to establish correlations between variables for samples of international and domestic students. We used CFA to determine the fit of the measurement model and path analysis to test the relationships between the variables within the conceptual model. We evaluated the fit of models to data by using: the goodness-of-fit test χ^2 (maximum likelihood estimation); the Root Mean Square Error of Approximation (RMSEA); the Standardized Root Mean Residual (SRMR); and the Confirmatory Fit Index (CFI). The CFI values of >.90 were acceptable. Hu and Bentler (1999) suggest that the probability of accepting an invalid model is very small when RMSEA is lower than .08 and SRMR is lower than .08. We used Amos 27.0 to test the hypotheses.

Results

We calculated descriptive statistics and correlations between variables separately for international and domestic students (see Table 2). The obtained

coefficients were statistically significant among all three aspects of online experience and academic outcomes, thereby supporting all hypotheses. Time spent in isolation did not determine academic outcomes, but it was only related to the student's technical capacity, in that the longer the time spent in self-isolation, the higher the capacity that both groups of students showed to participate in online learning.

Table 2: Pearson's *r* Correlations and Descriptive Statistics

		1	2	3	4	5	6	7	*M*	*SD*
1	Satisfaction IS	–							4.44	1.22
	Satisfaction DS	–							4.20	1.19
2	Adjustment IS	.62**	–						5.01	1.17
	Adjustment DS	.73**	–						4.71	1.22
3	Performance IS	.51**	.39**	–					3.12	1.66
	Performance DS	.45**	.33**	–					3.24	1.71
4	Loyalty IS	.56**	.44**	.37**	–				4.36	1.90
	Loyalty DS	.69**	.57**	.43**	–				4.15	1.81
5	Interactions with students' IS	.37**	.29**	.33**	.30**	–			4.62	1.32
	Interactions with students' DS	.27**	.25**	.26**	.22**	–			4.29	1.13
6	Technical capacity IS	.28**	.32**	.14**	.22**	.17**	–		4.04	1.45
	Technical capacity DS	.29**	.27**	.20**	.30**	.20**	–		4.51	1.40
7	Organization of online learning/Interactions with teachers' IS	.79**	.65**	.47**	.59**	.39**	.33**	–	5.76	1.15
	Organization of online learning/Interactions with teachers' DS	.76**	.69**	.34**	.68**	.27**	.31**	–	5.57	1.12
8	Time in isolation IS	.06	.05	.03	.06	−.05	.16*	.02	9.31	3.20
	Time in isolation DS	.04	.01	.04	.07	−.05	.20**	.02	9.89	2.58

Note: IS = international students (*N* = 362); DS = domestic students (*N* = 488).
**p* < .05 level (2-tailed). ***p* < .01 level (2-tailed).

Due to the potential correlations between explanatory variables, we tested the hypotheses within the conceptual model (see Figure 1), by using path analysis individually for international and domestic students. RMSEA indicated an unsatisfactory fit to the model for both international ($\chi^2(2) = 16.86$, $p < .001$; CFI = .984, RMSEA = .143 (CI90 [.086;.210]), SRMR = .021) and domestic students ($\chi^2(2) = 20.09$, $p < .001$; CFI = .973, RMSEA = .198 (CI90 [.147;.254]), SRMR = .030). To obtain a better model fit, we deleted statistically insignificant paths, which resulted in a satisfactory fit of the model to input data for international ($\chi^2(9) = 17.682$, $p = .039$; CFI = .991, RMSEA = .052 (CI90 [.011;.087]), SRMR = .048; see Figure 2) and domestic students ($\chi^2(7) = 10.694$, $p = .153$; CFI = .997, RMSEA = .033 (CI90 [.001;.070]), SRMR = .024; see Figure 2).
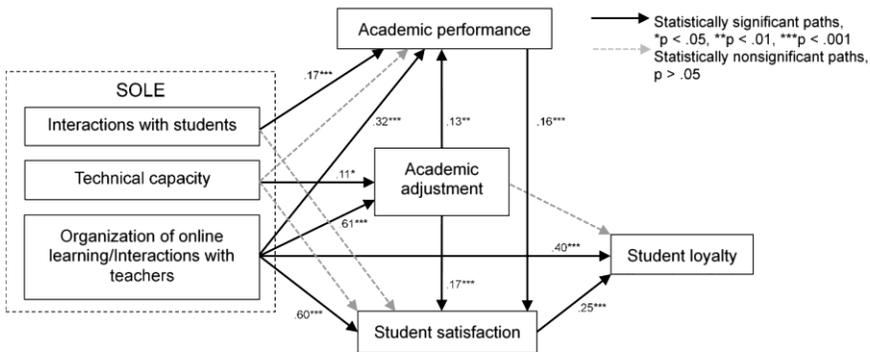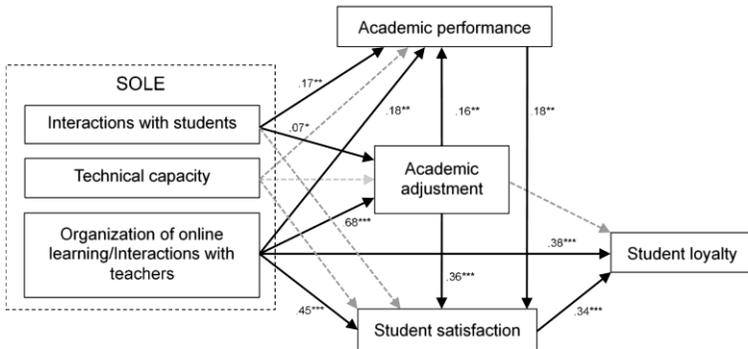

Figure 2: Path Analysis for International and Domestic Students (Standardized Coefficients).

STUDY B

Method

Interviewees

Out of the 850 students who had completed the online survey, 291 students (137 international and 154 domestic) agreed to participate in further research by leaving their e-mail address. Thirteen students accepted an email invitation to participate in an online interview. The sample is diverse and gender-balanced (eight females, five males). It includes 11 international students and two domestic students, 10 long-term (foreign) and three short-term (Erasmus) students from different faculties and programs (five in B.A., six in M.A., and two in Ph.D.) and of different years of study. They came from 10 countries (two from Poland; three from Ukraine; and one from Belarus, China, Hungary, Italy, Israel, Norway, Russia, and South Korea). Ten students studied from their home situated in Poland, and three studied in their home country. Their experience in Poland ranged between 6 months and 16 years.

Procedure

The first author conducted semi-structured narrative interviews in Polish and English via Google Meet between July 6 and 11, 2020 during the second semester or exam session, depending on the program. The interviews lasted between 37 and 95 min (60 min on average). Following the recommendations given by S. Jovchelovitch and M. W. Bauer (2000), we asked interviewees a general experiential question: "Please, tell me (a story) about your online learning experience at Polish University during the coronavirus pandemic." After delivering a story, we asked detailed questions regarding their experience. Finally, we asked "why" questions to deepen our understanding of a particular experience related in the story.

We audio-recorded interviewees with the interviewee's consent and transcribed them verbatim. Being guided by RQ2, two authors coded the material to extract narratives in which interviewees reflected on SOLE.

Analysis of Interview Material

Two authors analyzed the coded data thematically (Charmaz, 2014) to establish major themes meaningful to SOLE, whereas all four authors discussed and resolved divergent opinions through online meetings. The analysis established one overarching theme: SOLE during the COVID-19 pandemic; six subthemes: advantages of online learning, disadvantages of online learning, interactions with students, interactions with teachers, organization of online learning, and capacity to participate in online learning. The themes served to structure the findings section, which presents the results of the narrative analysis aimed at showing the sense that interviewees made of their experience (Polkinghorne, 1988).

Findings

Advantages of Online Learning

Students stressed that online learning was comfortable and time-saving. For example, David (M/31/Israel/PhD)[2] was satisfied with online communication tools as he could continue teaching activities from Israel: "I can give a guest lecture online for my university next week." Monika (F/25/Poland/MA), in turn, found remote communication with lecturers convenient and online exams less stressful:

> Online oral exams save our time. You don't wait for your turn for three hours in the university corridor. (…) We've reached a completely new level of communication due to this [pandemic] situation. Before, I had to arrange consultations with some lecturers via e-mail and received dates when they were available. Now, we can meet online.

Students allocated the time previously spent on commuting to the university to online assignments, reviewing the literature, and writing dissertations. The possibility of recording an online lecture allowed them to improve their understanding of the lecture's content. This helped them review the material for exams or better understand the parts misunderstood due to a language barrier, which facilitated their performance: "I feel positive about my study efficiency. My English is not that good and sometimes I couldn't catch the professor. But now, we can play the recording of a class and see what professors said, so it is easier" (Ling/F/21/China/BA).

Finally, students appreciated the opportunity to develop Internet and online communication skills, as well as to garner confidence to speak and share their opinions in public: "[The online class] helped me improve my confidence. When we meet online, I can ask anything I want, so it's good for me" (Ling/F/21/China/BA); "Before, I felt intimidated by other students, but now I don't find it difficult to share my opinion" (Monika/F/25/Poland/MA).

Disadvantages of Online Learning

Online learning was less favorably assessed by students who needed access to labs or face-to-face interaction (e.g., to practice foreign language skills). For Marina (F/26/Belarus/MA), an archeology student, pandemic restrictions prevented excavations, which considerably decreased her satisfaction with the program: "We need to practice and some of the things that are supposed to go on in the lab are not possible now. I wouldn't like it [online learning] to extend into the next semester."

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[2] We marked the authorship of the narratives by name/gender/age/country of origin/pursued degree. Interviewees' names are fictitious to protect their anonymity.

Some students emphasized that online learning deprived their experience of the unique academic atmosphere, which prevented their adjustment and decreased satisfaction:

> My classmates and I felt we are not part of this online learning mode. When in a classroom, we think together, solve problems, and here … the class is somewhat beyond us. It is difficult to concentrate. An online lecture lacks eye contact with the lecturer, so the whole university atmosphere is gone (Pavlo/M/20/Ukraine/MA).

Interactions with Students

Some international students were able to develop relationships with other students in online learning: "I've made friends with a couple of students thanks to group assignments, so we communicate more now than before" (Nadya/F/35/Russia/BA). For others, remote communication opened up out-of-class interaction opportunities with domestic students: "I have a [Polish] friend with whom I'm going on Erasmus next autumn. She is from another program, but we started to talk [online] about Erasmus" (Andriy/M/28/Ukraine/MA).

Nonetheless, most students emphasized that they missed in-class interactions, which caused dissatisfaction, hampered adjustment, and decreased studying efficiency as students could not hold debates or discussions: "I missed debates and contact with other students, which is one of the things I enjoy the most … " (Anne/F/26/Norway/MA).

Finally, students used online groups to support each other: "Facebook is the most used means of communication among international students. We talk about any problems: 'Have you managed to connect to this class?,' 'What is going on and why everyone is having technical problems?'" (Marina/F/26/Belarus/MA).

Interactions with Teachers

Students interpreted limited interactions with teachers in terms of teachers' transferring work to students: "We had one lecture in the first two months [of the pandemic], so our academic life has simply died. Instead of giving classes, one lecturer sent us books to read, which was exhausting" (Nadya/F/35/Russia/BA). The lack of interaction with teachers was detrimental to the overall academic experience: "In some classes, we needed to learn most of the stuff by ourselves, which was bad for the academic outcome generally, because we could not ask the teachers" (Anne/F/26/Norway/MA). In general, online teacher–student interactions did not measure up to the pre-pandemic academic context:

> [Before], I'd go to the university, attend a lecture, and the next day I'd practice in class what I'd learned in the lecture. Then I'd return home and do my homework, and everything would be fine. But online, I need to read the lecture and go through the slides, read the book and materials sent by the teacher, and then try to figure out how she's solved the problem in the lecture. This takes much more time … (Anastasia/F/18/Ukraine/BA).

Importantly, Marco (M/25/Italy/PhD) remarked that a flipped class format fostered students' understanding of the material, because students could read the material before the lecture and ask questions during the lecture. Moreover, students viewed constant contact with teachers and their timely responses to emails as a source of support and consolation in the difficult pandemic situation, which increased their satisfaction with the general study experience.

Organization of Online Learning

Students viewed the transition to online learning as disorganized, chaotic, and stressful, although some of them ascribed the organizational issues to the extraordinary pandemic situation: "The March and half of April were hell to me. Some classes didn't take place, and others were rescheduled. But, overall, considering how extraordinary the situation was, I think the university passed the test" (Marta/F/23/Poland/BA).

In terms of conducting classes, students raised a problem of using numerous online platforms, which hampered adjustment to online learning and caused dissatisfaction: "Our classes spread around four platforms. And you need to check several emails trying to get to what is going on" (Marina/F/26/Belarus/MA); "I had to make a list about what teacher wanted what and what kind of assignments to complete. It took me some time to get the hang of it" (Anne/F/26/Norway/MA).

Numerous changes to class schedules disoriented students and caused delays and stress. Monika (F/25/Poland/MA) related that her practical foreign language classes were stacked up, which was physically overwhelming and affected her study performance: "We lost the first month, so our classes were multiplied and we had to attend some classes three times a week. To catch up with the material, some classes lasted 2.5 hours, which was exhausting."

Students viewed email communication with university administration as an important support structure that relieved their stress regarding the pandemic: "The Dean's Office informed us about everything … they cared about us. They provided all the necessary information to prevent us from coronavirus" (Anastasia/F/18/Ukraine/BA). By contrast, insufficient information on the organization of online learning caused ambiguity and dissatisfaction: "The lack of phone contact with the Dean's Office was disruptive. I had problems figuring which classes I should attend, which stressed me out as I didn't want to take extra courses next year" (Monika/F/25/Poland/MA). Also, some international students appreciated the university's support in dealing with visa extension: "My faculty offered help with extending our visas and sent me an e-mail with the details of prolonging our stay here" (Ling/F/21/China/BA). Those who did not receive such help felt abandoned by the university, which, in turn, affected their loyalty to the university:

> I have to go back to my country to get a visa where I have to go on a 14-day quarantine. I've been trying to apply for a visa online, but the system is not working. And the university is not helping so I have to deal with it

by myself. (…) Maybe I could recommend studying here if some administrative things changed (Hae/F/29/South Korea/MA).

In terms of university support, most students expressed satisfaction with free access to psychological help at Polish University, although those who had used it stressed that three counseling sessions per semester did not suffice to deal with the pandemic stress.

Finally, students appreciated the extracurricular activities offered by the university, which helped them reduce academic stress: "[The International Student Office] invited us to attend different social gatherings and programs: from how to deal with the exam pressure, into learning Chinese, Polish, and to attending virtual museum tours. They did a very good job" (Anne/F/26/Norway/MA). Through online discussion groups, students could start relationships with other students and share their experiences with them: "There's an online foreign languages group. You can register online and the admin will give you partners to talk to. And I've known someone thanks to that" (Ling/F/21/China/BA).

Capacity to Participate in Online Learning

Essentially, students did not lack technical skills or access to Internet infrastructure. Prior online learning experience facilitated adjustment to new studying conditions during the pandemic. However, students' capacity to participate in online classes was determined by external studying conditions. For some students, learning from home was motivating and fostered concentration, but others found it distracting due to other household members or noises heard from other students' homes. Nevertheless, overall, domestic students who resided with their families during the pandemic implied that they experienced support from their family during their academic experience and their home relieved their stress: "When we had oral exams, everybody went out to the garden, so I had perfect conditions for the exam, maybe even support … " (Monika/F/25/Poland/MA); "We tried to be together in the pandemic, having a laugh at a glass of wine, barbecuing, or simply watching TV" (Marta/F/23/Poland/BA).

DISCUSSION

This research aimed at exploring the academic outcomes of SOLE for international and domestic students studying at Polish University during the coronavirus pandemic. To determine the relationships between SOLE and academic adjustment, performance, student satisfaction, and loyalty, and understand how those relationships were shaped, we conducted Study A and Study B based on, respectively, online survey and interview data.

Study A supported all hypotheses (H1a-d) predicting the relationships between SOLE and students' academic performance, adjustment, satisfaction, and loyalty. This finding contributes to the literature by establishing the relationships between the pandemic SOLE and academic outcomes. The perceived organization of online learning/interactions with teachers has the most predictive power in the

model due to strong relationships with all academic outcomes, which suggests that it plays a crucial role in both international and domestic students' experience.

We found that interactions with students are related to academic performance in both groups. Study B explained this relationship by the important role of in-class debates and discussions in students' understanding of the material. Interactions with students are also related to domestic students' academic adjustment, although this relationship is weak (.07, $p < .05$).

Finally, students' technical capacity is significantly but weakly (.11, $p < .05$) associated only with academic adjustment for international students, which suggests that this aspect has a marginal effect on the academic outcomes. Moreover, although some research suggests that prior experience in online learning translates to students' higher comfort with online learning (Jones & Wolf, 2001), our research established no link between students' technical capacity and their satisfaction, which confirms relatively recent empirical results (Marks et al., 2016). Study B revealed that students felt comfortable participating in online classes. Although they encountered minor problems using microphones and cameras during online class, they could overcome them over time. Moreover, despite the external distractors (e.g., inconvenient household conditions), their adverse impact seemed to be counterbalanced by the advantages of online learning, such as the time-saving remote access to the class, an opportunity to replay online lectures or stay with the family at home, which relieved the pandemic stress of domestic students.

We found that academic adjustment directly predicted performance and satisfaction, and it indirectly predicted loyalty through satisfaction (H2a-c supported). This result not only corresponds with conventional learning models (van Rooij et al., 2018), which show that motivational and behavioral variables affect academic success via adjustment, but also extends them to online learning. Next, satisfaction was explained by performance (H3 supported), whereas loyalty was explained by satisfaction (H4b supported) and indirectly by performance via satisfaction (H4a supported). These results extend research on student experience in conventional learning that has linked satisfaction with loyalty (Chandra et al., 2018; Turkyilmaz et al., 2018; van Rooij et al., 2018) to online learning.

This research extends the validity of prior results on students' experiences in conventional and online learning to, first, the pandemic SOLE and, second, to both international and domestic students. Interestingly, the time spent in self-isolation did not affect the SOLE outcomes, although students could develop their technical capacity to participate in online learning over time. This suggests that the results may be extrapolated to online learning in general, regardless of disruptive events such as pandemics.

Another important contribution is establishing a significant relationship between the perceived organization of online learning/interactions with teachers and loyalty to university for both international (.40, $p < .001$) and domestic (.38, $p < .001$) students. Study B revealed that students found the transition to online learning stressful due to using numerous learning platforms, frequent schedule changes, and too much workload; in addition, their loyalty was dependent on the perceived supported from the university (e.g., with visa extension, psychological

help). For domestic students, the relationship between the organization of online learning and loyalty is direct. For international students, academic adjustment mediates the relationship between the organization of online learning and satisfaction (e.g., with information on the organization of online learning received from the Dean's Office, which mitigated uncertainty and ambiguity regarding online class attendance). This finding extends prior research linking student satisfaction with loyalty (e.g., Turkyilmaz et al., 2018) by pointing to the mediating role of adjustment in the satisfaction–loyalty relationship in the group of international students. Adjustment is critical to international students' academic experience, especially during the pandemic (Forbes-Mewett, 2020), and is the main predictor of academic performance and success (Rienties et al., 2012).

CONCLUSIONS, LIMITATIONS, AND IMPLICATIONS

In sum, this research contributes to the emerging literature on SOLE during a pandemic and its academic outcomes. It established, based on online survey data, relationships between SOLE and academic adjustment, performance, and student satisfaction and loyalty. Further, interview data contextualized SOLE at a Polish University during the pandemic, deepening our understanding of the phenomena captured by the structural models.

This research has certain limitations, which, nonetheless, warrant future investigations. First, the data were collected through self-reports to capture the pandemic SOLE. Further triangulation of data sources, for example, including teachers and university staff, could introduce more plurivocality of perspective. Second, SOLE was investigated in one national and academic context. Although data were collected from students from 63 countries, comparative research across various national and educational contexts, for example, considering SOLE in the hybrid learning mode, could shed more light on the effects of particular aspects of SOLE. Third, because the SOLE-S primarily captured student engagement at the institutional level, future research could consider some non-institutional factors. These could include pandemic-related hardships (e.g., loss of income), students' mental health, social support structures, and others. Finally, although we investigated SOLE in two groups of students, future research could consider the within-group variation in that experience. For example, exploring the impact of students' economic status, cultural background, and the COVID-19 pandemic-related challenges (e.g., visa concerns, social exclusion, culture-based discrimination in case of international students) that contribute to students' vulnerability (Forbes-Mewett, 2020) could further our understanding of SOLE.

The established three-factor structure of SOLE-S successfully captured relationships between distinctive realities of SOLE and academic outcomes among culturally diverse students. Thus, using SOLE-S in cross-cultural research could serve to validate the universality of the model established.

In terms of practical implications, given the mediating role of adjustment between students' satisfaction and loyalty, universities should support students' coping with university demands. For example, our findings point to the relevance of up-to-date information on the pandemic and the organization of online learning

for fostering students' awareness of university demands and decreasing ambiguity (e.g., regarding class attendance or teachers' expectations), uncertainty, and stress. Further, compensatory support structures should be developed to mitigate stress caused by limited socialization in SOLE. Our interviewees' positive experience with psychological counseling, extracurricular events, and student online groups organized and administered by the university suggests that the development of those support structures could improve students' psychological well-being and generate a feeling of being cared for (Forbes-Mewett, 2020). Moreover, this research established that students' perceptions of the organization of online learning and their interactions with teachers determine their loyalty. Therefore, universities should raise student–teacher online interactions by training teachers on up-to-date online teaching methods and tools that allow teachers to monitor and better satisfy students' needs, facilitate teacher–student communication, and promote creative in-class collaboration.

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DECLARATIONS OF INTEREST

None

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