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School Belonging in Online Instruction: Cross-Sectional and Prospective Relationships with Academic Adjustment in Higher Education Students During the COVID-19 Pandemic

Abstract

The study aimed to analyse changes in school belonging in higher education students during online instruction and to verify its cross-sectional and longitudinal relationships with academic adjustment in the first and higher years of study. The research sample consisted of 169 higher education students (90.5% women, M = 21.71; SD = 2.63) in the first measurement (end of the winter term), and 77 respondents (96% women, M = 21.38; SD = 2.03) in the second measurement (end of the summer term). Self-report methods were used. Results showed a decline in school belonging among first-year students. School belonging significantly predicted academic adjustment, and the relationship with internal motivation persisted even four months later. The findings support the key role and need for facilitating school belonging in higher education students in the online environment.

Keywords: *school belonging, online education, COVID-19 pandemic, intrinsic motivation, academic stress, higher education students*

Introduction

School belonging is the extent to which students feel personally accepted, supported, and emotionally engaged at school (Goodenow, 1993). Many studies show that school belonging is a key factor in psychological well-being (Šeboková, et al.,

2018) and academic adjustment (Dukynaité & Dudaité, 2017). Also, its positive effect persists over time and affects academic achievement, motivation throughout the study (O´Neel & Fuligni, 2013), and achievements in further education and employment (Parker et al., 2021). The importance of school belonging has been proved not only in students of elementary and secondary schools, but it is a fundamental need also of higher education students (Arslan, 2021). However, only a small number of research has focused on school belonging in online instruction, while it has several specifics- the social distance from peers, teachers and the school community, emphasis on individual work (Xie et al., 2020) that may directly influence school belonging.

Due to the COVID-19 pandemic, schools were temporarily closed almost in all countries around the world (as well as in Slovakia), and it is estimated that up to 1.4 billion children were deprived of face-to-face instruction (UNESCO, 2020). The involuntary change in education brought students social isolation and increased demands on academic adjustment, which had a negative impact on their academic stress (Orosová et al., 2021), academic motivation (Tan, 2021) and school belonging (Arslan, 2021). Students in the first year of study, just after their transition to high school, were the group at the greatest risk when compared with students in higher grades (O´Neel & Fuligni, 2013); they had not completed even one term of face-to-face instruction and had fewer opportunities to develop relationships with their peers, teachers and school community.

Besser, Flett, and Zeigler-Hill (2020) found that students experienced higher stress, lower motivation and lower school belonging in online learning compared to face-to-face learning. In his qualitative research, Chiu (2021) observed that students perceived online education as a barrier to building relationships with their classmates, teachers, and school community. Similarly, Wester et al. (2021) found that school belonging failed to increase after the transition to online learning. At the same time, research on face-to-face instruction showed that school belonging increased with the time spent at higher education institutions (Pittman & Richmond, 2008).

School belonging is one of the most important needs and a predictor of academic and psychological prosperity in the online environment (Peacock & Cowan, 2019), and it may have a protective effect in a pandemic situation (Arslan, 2021). In the research mentioned above, Besser et al. (2020) observed significant relationships between a higher level of school belonging and adjustment to the pandemic situation, and higher motivation and lower stress in higher education students. In the presented study, we wanted to verify the protective function of school belonging in online education in relation to the selected factors of academic adjustment:

intrinsic motivation and academic stress that appear to be key factors in particular in the context of online education and pandemic situation (Abdollahi et al., 2020; Chiu, 2021).

Academic stress is a mismatch between academic demands and subjectively perceived abilities to cope with these demands (Pluut et al., 2015). Research shows that a higher level of school belonging reduces the risk of experiencing academic stress (Abdollahi et al., 2020). Academic motivation is the extent to which students are motivated to learn and achieve good results at school (Eccles et al., 1993). Several theories assume that higher connectedness with school supports the internalisation and achievement of academic values (Eccles et al., 1993) shaping vocational identity (Baňasová & Sollár, 2016). According to the findings of O´Neel and Fuligni (2013), school belonging predicts higher intrinsic motivation in five years of study at secondary school.

Research Problem

In summary, it can be said that school belonging is a key predictor of students' academic adjustment. However, research has so far paid less attention to school belonging in the online environment. In addition, most research has focused on students at lower levels of education (elementary and secondary schools), used a cross-sectional design and disregarded the year of study and the significance of transition in first-year students. Reflecting the shortcomings of previous research, the presented study focuses on: 1) analysing changes in school belonging in higher education students during online instruction due to the COVID-19 pandemic in one academic year; 2) verifying the cross-sectional and longitudinal relationships of school belonging with intrinsic motivation and stress; 3) analysing the moderating effect of the year of study in the relationship between school belonging and motivation and stress.

Methods

Research Sample

The research sample comprised 169 students (90.5% women) with a mean age of 21.71 years (SD = 2.63) from two universities in West Slovakia. 87 students (51.5%) were in the first year, and 82 students (48.5%) were in higher years of study (out of them, 24.9% were in the 3rd year and 23.6% in the 4th year of study). Data

were collected at two time points: the first time in January and February 2021, when students filled in a battery of questionnaires for the winter term period (T1), and the second time in May/June 2021, when students filled in a battery of questionnaires for the summer term period (T2). Data were collected during the second wave of the pandemic in Slovakia when instruction was conducted online over the whole academic year. Due to organisational reasons, participants of the second measurement were only students of one university. Their total number was 108 respondents (M = 22.09; SD = 3.4; 93.5% women; 53.7% in the first year). After the exclusion of missing values or respondents not possible to match on the first measurement, the final sample consisted of 77 respondents (96% women) with a mean age of 21.38 years (SD = 2.03); 46.75% students in the first year and 53.25% students in higher years of study.

Methods

Connectedness to School and Teacher (Waters & Cross, 2010) – capturing how a young person feels at school and how much he/she feels to be a part of it. It consists of three parts: 1 – Connectedness to School is captured in 5 items assessed on a 4-point Likert scale 1 (never) – 4 (always), a higher score indicating higher belonging to school ("I feel to be a part of this school"). 2 – Connectedness to Teacher and 3 – Connected to Family were not part of our research plan. In the presented study, the Connectedness to School scale gained the acceptable internal consistency value α = 0.76 (T1) and α = 0.75 (T2).

   Student Stress Questionnaire (Pluut et al., 2015) – consisting of 12 items, expressing on a 5-point Likert scale how much the statements are stressing (1 – not at all; 5 – extremely). A higher score indicates higher stress. Examples of questionnaire items: "Coping with the academic/study load", and "Fear of not meeting the requirements for passing the subject". In the presented study, high internal consistency values of the scale were recorded α = 0.88 (T1) α = 0.87 (T2).

   Learning Motivation Questionnaire M-2 (Pavelková, 2002) – determining 8 aspects of pupils' learning motivation. The presented study used only scales related to intrinsic motivation: Cognitive Motivation (8 items: "I learn because I want to know a lot") and the Need for Achievement (7 items: "I learn because I have a good feeling when I have learnt something"). Respondents answer on a 5-point scale from 1 = never to 5 = always. In the presented study, the scales yielded the following values of internal consistency: Cognitive Motivation α = 0.78 (T1) and α = 0.80 (T2), Need for Achievement α = 0.82 (T1) and α = 0.83 (T2).

Results

In the first step, we focused on descriptive characteristics and tested the studied variables for normal distribution. All variables in the groups of first-year students and students in higher years of study at both time points met the condition of normal distribution. Therefore, parametric tests were used next to verify differences between the two groups of students (first-year students vs students in higher years) and examine changes in the variables between the first (winter term) and the second (summer term) measurement. The results of the descriptive analysis and the t-test for two independent samples are presented in Table 1.

Table 1. Descriptive characteristics of variables

T1	1st year, n = 87				2nd-5th year, n=82					
	M	SD	skew	kurt	M	SD	skew	kurt	t	D
1 School belonging T1	15.76	2.88	-0.39	-0.08	15.83	2.60	-0.36	-0.36	-0.17	0.03
2 Intrinsic motivation T1	58.95	9.32	-0.87	0.29	58.68	7.72	-0.51	-0.49	0.20	0.03
3 Academic stress T1	34.77	9.59	-0.38	-0.37	32.09	8.80	0.40	0.44	1.89	0.29
T2	1st year, n = 36				2nd-5th year, n = 41					
4 School belonging T2	14.72	2.94	0.18	-0.84	15.92	2.08	0.33	-0.14	**-2.09***	0.47
5 Intrinsic motivation T2	60.29	8.25	-0.40	-0.59	59.21	7.19	-0.48	-0.21	0.60	0.04
6 Academic stress T2	37.61	8.48	-0.33	-0.33	31.88	9.83	-0.22	-0.79	**2.72****	0.62

$^*p < .05$ $^{**}p < .01$ $^{***}p < .001$

The results of the t-test for two independent samples (Table 1) showed differences between the tested variables only in the second measurement, school belonging was statistically significantly higher in students in higher years of study (p = 0.04), and academic stress was statistically significantly higher in students of the first year (p = 0.008). Both differences were also practically significant (d = 0.47 and 0.62).

The results of the t-test for two dependent samples in the whole sample did not show significant differences in the level of the tested variables at the end of the winter and the summer term. Verification of changes in the tested variables

separately in groups by the year of study revealed significant changes in the variable school belonging in students of the first year. The level of school belonging decreased significantly during the first year (Md = 0.61, t (35) = 2.12, p <0.05). The practical significance of the decrease was small (d = 0.35).

Next, predictive relationships between school belonging (T1) and academic stress and intrinsic motivation in both measurements (T1 and T2) were verified by means of a simple linear regression analysis. The results are presented in Table 2.

The results of the regression analysis showed that school belonging (T1) statistically significantly predicted higher intrinsic motivation (β = .45***) and lower academic stress (β = -.28***), explaining 20% or 7.7% of the academic adjustment variance (T1). The effect of the prediction persisted even after four months when school belonging in the winter term (T1) statistically significantly predicted higher intrinsic motivation also in the summer term (T2) (β = .31**), explaining 13.6% of the intrinsic motivation variance. The prediction was not confirmed for academic stress in the summer term.

**Table 2.** Results of regression analysis in relation to school belonging and academic adjustment in two measurements

1st year	Intrinsic motivation T1		Academic stress T1		Intrinsic motivation T2		Academic stress T2	
	b	β	b	β	b	β	b	β
School belonging T1	1.38	.45***	-0.94	-.28***	1.03	.31**	-0.68	-.20
	R^2=20% $F_{(1.164)}$ =40.87***		R^2=7.7%. $F_{(1.167)}$ =13.97***		R^2=13.6%. $F_{(1.72)}$ =11.35**		R^2=3.8%. $F_{(1.75)}$=2.96	

*p < .05 **p < .01 ***p < .001

A moderation analysis was run in the program PROCESS by A. Hayes to verify the moderating effect of the year of study. The model was tested where school belonging was the independent variable (T1), and academic stress (T1 and T2) and intrinsic motivation (T1 and T2) were the dependent variables, and the moderator was the year of study. The results showed that the relationship between school belonging (T1) and academic stress (T1) was moderated by the year of study. The tested model was significant R^2 = 15.47%, $F_{(3.165)}$ = 10.07, p < .001. The variable of interaction (school belonging x year of study) was a significant predictor of academic stress (b = 1.64, p = .001) and explained 5.8% of added variance. The practical significance of the moderating effect was medium (f^2 = 0.18). A simple slopes

analysis showed that school belonging was a significant negative predictor of academic stress in first-year students (b = -1.65, p < .001) but not in students in higher years of study (b = -0.01, p = .99). The findings are illustrated in Graph 1. The year of study did not appear a significant moderator in other tested relationships.
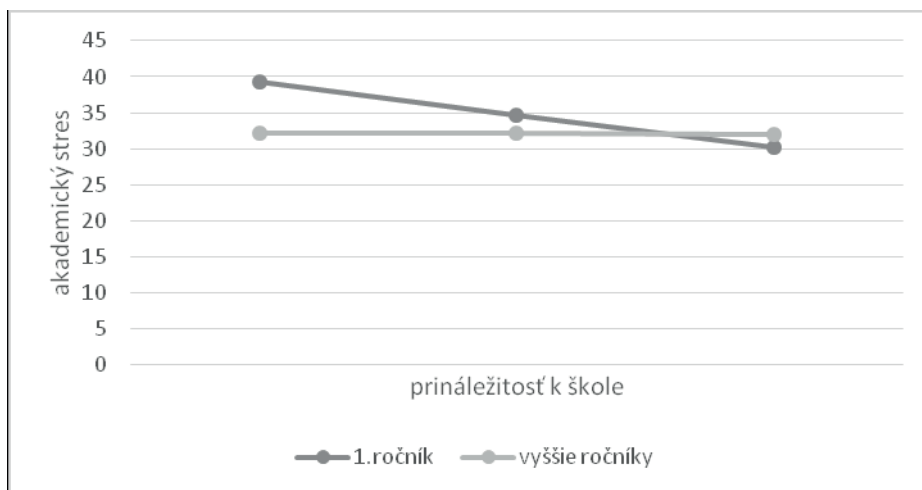
Graph 1. Moderating effect of the year of study in relation to school belonging (T1) and academic stress (T1)

Discussion

The presented study investigated the level and benefits of school belonging for higher education students' academic adjustment during online instruction due to the COVID-19 pandemic. We aimed to analyse changes in school belonging in higher education students in the academic year during online education and to verify the cross-sectional and longitudinal relationships of school belonging with intrinsic motivation and academic stress. We also examined whether these relationships were moderated by the year of study. The research results brought 3 major findings:

Firstly, we found out that the level of school belonging in students in the first year decreased in the academic year and was significantly lower in the second measurement than in students in higher years of study. School belonging remained

stable in students in higher years. Thus, the results are consistent with research documenting a slowdown or decrease in the development of school belonging in online instruction compared to face-to-face education (Besser et al., 2020; Chiu, 2021; Wester et al., 2021). The findings suggest that compared to face-to-face instruction, the online environment, missing physical interaction, direct communication and emotional support, represents a considerable disadvantage for building relationships and a stronger sense of school belonging. A greater risk of the online environment appears in first-year students, for whom the transition and adaptation to the new environment is an increased burden (Šeboková et al., 2018) and who do not have opportunities enough to develop relationships with their peers, teachers and school community during online instruction when compared with students in higher years of study (3rd and 4th). However, our conclusions are formulated very cautiously since we are aware of the small size of the sample, especially in the second measurement, and its composition (more than 90% women), and thus the limited possibility to generalise the findings to the whole population of university students.

The second significant finding is that school belonging plays an important role in support of academic adjustment, especially intrinsic motivation in higher education students during online instruction. The results show that a higher level of school belonging is associated with higher intrinsic motivation regardless of the year of study, with the protective effect of school belonging persisting even after four months. The findings support the theoretical assumptions that higher school belonging leads to the internalisation of academic values (Eccles et al., 1993), and the results of research documenting the protective role of school belonging in relation to academic adjustment and engagement in higher education students during online education during the COVID-19 pandemic (Besser et al., 2020). However, our results supplement the previous findings with the longitudinal effect and emphasise that the protective role of school belonging in relation to intrinsic motivation persists during the whole academic year.

Thirdly, our findings suggest that school belonging during online instruction plays a more significant role in academic stress in students in the first year when compared with students in higher years. It turns out that it is the feeling of acceptance and support in the online environment at a higher education institution that appears to be a key factor in reducing the level of academic stress in first-year students at the time of transition (O´Neel & Fuligni, 2013; Šeboková et al., 2018).

In general, our results support the assumptions of a significant positive role of school belonging in support of higher education students' academic prosperity in online learning (Peacock & Cowan, 2019). Our findings accentuate the need for

higher education institutions to focus on developing students' school belonging during online instruction. Students in the online environment should also feel accepted and valued, heard and seen by their teacher and peers. They should have opportunities to show their emotions, thoughts, and experience with work in the online environment and receive support and encouragement from their peers and teachers (Besser et al., 2020).

The presented study has some limitations. Firstly, it is the size and composition of the sample. The sample size is smaller, especially in the second measurement, and it is composed of women up to 90%, which is related to the representation of sexes in the branches studied (mostly psychology and social work, with a smaller representation of agricultural branches). These limitations restrict the possibility to generalise the results to the whole population of higher education students. Therefore, we cautiously comment on the conclusions related to the changes in school belonging. However, the findings correspond with the results of foreign research, and their contribution is in pilot verification of the effect of online education on school belonging in Slovak conditions. We plan repeated measurements in future, including all respondents from the first measurement, more even representation of men and women, and extending the sample by more branches since previous research indicates differences in coping with stress in students of various branches (Hudáková, 2021). The percentage of explained variance in the regression model is, especially in the case of academic stress, lower (7.7%), which indicates that in addition to school belonging, there are many other factors (e.g., student's personality, coping styles, teacher's personality…) that contribute to academic stress experienced by students. A limitation of our work is the failure to capture the initial level of school belonging at the beginning of the academic year, which would allow us to monitor the trajectory of changes in the course of the academic year.

Summary

Despite the limitations, the contribution of the presented study is the pilot verification of school belonging and both its cross-sectional and prospective roles in academic adjustment in higher education students during online education due to the COVID-19 pandemic in Slovakia and the emphasis on the need for universities to focus on facilitation of students' school belonging and thus also the support of their academic prosperity.

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