



## Article

# How Did Students with Different Learning Profiles Experience 'Normal' and Online Teaching Situation during COVID-19 Spring?

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**Abstract:** This study compares university students' approaches to learning and experiences with the teaching–learning environment in general and during online studying as a result of the COVID-19 pandemic. It examines students' learning profiles and how students with different learning profiles experienced the teaching–learning environment during COVID-19 as well as their approaches to learning and study-related burnout in general. The participants were 665 first- and second-year students. The profiles were examined using K-means cluster analyses and the differences in learning profiles using one-way ANOVA and the Tuckey Test. The results show changes in students' approaches to learning and their experiences with the teaching–learning environment and study-related burnout within the different profiles when comparing a normal situation to the COVID-19 pandemic. We suggest that changes in study-related burnout can be different among different study profiles. The results imply that students with a fragmented knowledge base and difficulties in managing time and effort would require special attention in online teaching situations.

**Keywords:** approaches to learning; teaching–learning environment; study-related burnout; higher education; COVID-19; person-oriented approach



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## 1. Introduction

The COVID-19 pandemic has affected higher education in many ways. In spring 2020, universities around the world have been forced to close their doors and move solely to online teaching (Marinoni et al. 2020). Without prior opportunity to practice navigating a shift from contact teaching to fully online teaching, many students and teachers found the quick transition to online teaching challenging, which consequently had negative effects on students' learning, level of engagement (Petillion and McNeil 2020) and mental wellbeing (e.g., Huckins et al. 2020; Kaparounaki et al. 2020; Wang and Zhao 2020; Zimmermann et al. 2020; Baticulon et al. 2021). Especially first- and second-year students have had greater difficulties in adjusting to online learning (Baticulon et al. 2021). Moreover, a recent comprehensive study comparing 62 countries focuses on students' experiences with teaching, studying and wellbeing, revealing that while students have been satisfied with the support provided by the teaching staff, they also reported increased feelings of anxiety and frustration and that the heavy workload has prevented them from perceiving how their performance has improved in the new teaching environment (Aristovnik et al. 2020). A study by Lovric et al. (2020) showed similar results, as students praised the teacher support and work done by faculty members during the pandemic. Furthermore, a study by Bdair (2021) found that both students and teachers have appreciated the flexible online learning environment and that teachers and students feel that students' academic achievement has improved through online learning (Bdair 2021). However, at the same time students have reported difficulties in motivation and learning, in feeling integrated

with the academic community and being worried about their and their family's wellbeing (Bdair 2021; Baticulon et al. 2021; Lovric et al. 2020; Petillion and McNeil 2020). In addition, many students report that online learning has had a negative impact on the scheduling of their studies (Bdair 2021; Baticulon et al. 2021; Petillion and McNeil 2020) and on their interaction with teachers and other students (Kedraka and Kaltsidis 2020). Moreover, students have expressed concern about the assessments (Petillion and McNeil 2020) and their academic achievement (Sundarasan et al. 2020).

To summarise, recent research focusing on student experiences during the pandemic has shown that students have had both negative and positive experiences with teaching and studying. The pandemic and online teaching and learning have also negatively affected students' wellbeing (e.g., Huckins et al. 2020; Kaparounaki et al. 2020; Wang and Zhao 2020; Zimmermann et al. 2020). Thus, while much research has been done on student experiences and wellbeing during the pandemic, to our knowledge such studies have not taken students' study processes into account, even though there is evidence that study processes are related to, for example, student experiences with the teaching–learning environment (Parpala et al. 2013; Richardson and Price 2003) as well as the risk of burnout (Asikainen et al. 2020). It is important to focus on study processes and wellbeing since online teaching has lasted for so long during the pandemic, and students should by now have been able to learn to study more effectively in the online teaching–learning environment. Moreover, not many studies have sought to compare students' experiences before and during the pandemic, especially when taking the theory of learning in higher education into account. Thus, the present study aims to address this gap by examining higher education students' experiences with teaching, learning and risk of burnout during the pandemic while taking also different learning profiles into account. In addition, the present study compares students' experiences before and during the pandemic.

### *1.1. Approaches to Learning and Experiences with the Teaching–Learning Environment*

Student learning processes can be examined using concept approaches to learning, which refer to students' intentions concerning their studies and learning as well as their learning processes (e.g., Asikainen and Gijbels 2017; Biggs 2001; Entwistle 1998, 2009). Studies have generally recognised three different concept approaches. With a deep approach, information is analysed and understood by comprehending the bigger picture, focusing on underlying meanings and integrating new information with previous knowledge. A surface approach has been usually characterised by a focus on memorisation, often resulting in a fragmented knowledge base where information is seen as fragmentary and unrelated (Entwistle 2009). However, a recent study suggests the surface approach includes unreflective studying and experiences of a fragmented knowledge base rather than memorisation and the repetition of knowledge, and it could thus be labelled the unreflective approach (Lindblom-Ylänne et al. 2019). A third approach, labelled as organised studying, refers to students' everyday practices in terms of how they manage and organise their studies and their time (Entwistle and McCune 2004). It is therefore considered to be more of an approach to studying than an approach to learning (Entwistle 2009; Entwistle and McCune 2004), though the concept approaches to learning refers to both deep and surface approaches as well as to organised studying in the present study. Person-oriented methods have made it possible to detect students with different combinations of approaches to learning in different academic disciplines (Haarala-Muhonen et al. 2017; Parpala et al. 2010). Interestingly, while research has shown that there is a strong negative correlation between the deep and surface approaches to learning, person-oriented studies have found theoretically different combinations of approaches to learning. For example, in their study Fryer and Vermunt (2018) found that Asian students are able to use both surface and deep approaches to learning either together or in a stepwise process. In addition, profiles combining deep approach with both unorganised and organised studying have been found in different higher education contexts (Asikainen et al. 2020; Haarala-Muhonen et al. 2017;

Parpala et al. 2010) although deep approach has usually been correlating positively with organised studying (Richardson 2000).

Moreover, researchers have found that the approaches to learning operate in relation to students' experiences with quality in teaching (Herrmann et al. 2017; Parpala et al. 2013; Richardson and Price 2003). Many studies have measured students' experiences with quality teaching using dimensions that focus on important elements of the teaching–learning environment based on both evidence and studies on the components supporting students' in-depth learning processes (Entwistle et al. 2003), including interest and relevance of the content, constructive feedback received during the teaching, peer support and alignment of aims and teaching methods (Entwistle et al. 2003; Herrmann et al. 2017). Students with high scores on the deep approach to learning tend to score higher on these scales (Postareff et al. 2018). Not much research has yet been done on how learning processes are related to experiences of the teaching learning environment during the pandemic.

### 1.2. Study-Related Burnout in Relation to Approaches to Learning

Burnout in the context of work has been defined as emotional exhaustion, cynicism and reduced professional efficacy (Maslach et al. 2001). A similar definition of burnout has emerged in a school and university context, where study-related burnout has been defined through three different components: study-related-exhaustion, cynicism and lack of study-related efficacy (Salmela-Aro et al. 2009; Salmela-Aro and Kunttu 2010; Schaufeli et al. 2001). Study-related exhaustion refers to feelings of being burdened or exhausted as a result of overtaxing work; cynicism refers to a lack of interest and a cynical or indifferent attitude towards studying generally and in relation to others; and lack of professional efficacy refers to feelings of incompetence and poor achievement in studying (Salmela-Aro et al. 2009). All these aspects of study-related burnout have been found to affect students' engagement and dedication to their studies (Salmela-Aro and Upadyaya 2017). Studies concerning the relationship between study-related burnout and engagement have focused more on integration, such as dedication, vigour and absorption of material when studying (Salmela-Aro and Upadyaya 2017; Salmela-Aro 2017), but research concerning the relationship between cognitive engagement or study processes and study-related burnout is still lacking. Previous research has shown that the unreflective approach learning (prev. surface approach) is related to a higher risk of burnout (Asikainen unreflective approach learning (prev. surface approach) et al. 2020).

### 1.3. Aim

This study examines how university students with different learning profiles have experienced the teaching–learning environment (teaching, learning and study-related burnout) before the pandemic (normal situation) and during online studying as a result of the COVID-19 pandemic. The research questions are as follows: (1) How have students with different learning profiles during normal teaching situations experienced the new (a) teaching–learning environment and (b) approaches to learning, and what are their experiences with (c) study-related burnout during the COVID-19 pandemic compared to normal situations?

## 2. Materials and Methods

The data were collected from first- and second-year university students in spring 2020 from the University of Helsinki. It was collected during the early stages of the lockdown, in March–April 2020. A total of 665 students chose to participate in the study: 469 first-year students and 196 second-year students from different faculties. First-year students were from the Faculty of Biological and Environmental Sciences (N = 143), Veterinary Medicine (N = 62), Educational Sciences (N = 117) and Faculty of Social Sciences (N = 147). Second-year students were from the Faculty of Law (N = 152), Theology (N = 21) and Arts (N = 23).

The students were first asked to describe studying in general in their degree programme, with additional questions then posed regarding learning online during the pandemic situation. The data was collected using the HowULearn questionnaire (Parpala and Lindblom-Ylänne 2012). A normal, pre-pandemic situation was measured using scales measuring students' approaches to learning (deep approach, unreflective approach (prev. surface approach), organised studying), their experiences with the teaching–learning environment (peer support, interest and relevance, constructive feedback, alignment of aims and teaching methods) (Parpala and Lindblom-Ylänne 2012), and two components of study-related burnout (exhaustion, cynicism) (Salmela-Aro et al. 2009). Students' experiences with pandemic online learning were assessed via items from each scale used to measure learning during a normal situation. The strongest items on the scales were used and modified for online studying during the COVID-19 pandemic. Inadequacy, which is one part of study-related exhaustion (Salmela-Aro et al. 2009) was not included in the study due to the limited number of items on the scale and low factor loadings. All items were measured using the Likert scale, ranging from a score of 1 to 5, except for study-related burnout; the Likert scale varied too much to adequately measure this item. The Likert scale measuring study-related burnout ranges in a normal situation from 1 to 6, whereas during the COVID-19 pandemic it has been adjusted to fit a 1 to 5 scale. The data gathering followed the ethical principles of research with human participants and ethical review in the human sciences in Finland and Finnish National Board on Research Integrity (TENK) guidelines.

Confirmatory factor analyses were conducted for the scales measuring students' approaches to learning, their perceptions of the teaching–learning environment and study-related burnout in a normal situation. The fit for the model was based on the comparative fit index (CFI) and root mean square error of approximation (RMSEA). A good fit was indexed with CFI values above 0.95 and RMSEA values below 0.06, but values over 0.90 for CFI and values under 0.8 for RMSEA can be regarded as acceptable (Hu and Bentler 1999). After conducting confirmatory factor analyses, the profiles concerning students' approaches to learning were assessed using K-means clustering based on the data focusing on a normal situation. The students' experiences were examined using one-way ANOVA and the Tuckey Test to examine how they differed in a normal situation and during the COVID-19 pandemic. Regarding the differences in study-related burnout, Z-scores were used because the Likert scales were different.

### 3. Results

The confirmatory factor analyses produced acceptable models (see Table 1) concerning students' experiences with the teaching–learning environment (CFI = 0.920, RMSEA = 0.078) and study-related burnout measured based on exhaustion and cynicism (CFI = 0.992, RMSEA = 0.044). One item measuring the deep approach ('I carefully check for substantiation and proof before I draw my own conclusions about the course material') did not fit the model and was deleted from the analysis; thus, we obtained an acceptable model for assessing students' different approaches to learning (CFI = 0.927, RMSEA = 0.044).

**Table 1.** Result of the confirmatory factors analyses.

	CFI	RMSEA	$\chi^2$	df	<i>p</i>
Approaches to learning	0.927	0.069	170.97	41	<0.001
Teaching–learning environment	0.920	0.078	295.19	59	<0.001
Exhaustion and cynicism	0.992	0.044	29.54	13	0.005

We examined different learning profiles during a normal situation. Four different learning profiles emerged: (1) unorganised and unreflective students (15.5%), (2) deep and unorganised students (30.8%), (3) students representing the deep approach (33.2%) and (4) all high students (20.5%). The cluster scores can be seen in Table 2.

**Table 2.** Cluster centres.

Scale	C1. Unorganised and Unreflective Students	C2. Deep and Unorganised Students	C3. Students Representing Deep Approach	C4. All High Students
Unreflective studying	3.10	2.20	2.06	3.19
Organised studying	2.50	2.87	4.06	3.80
Deep approach	3.43	4.28	4.38	3.93

First, we analysed how different learning profiles varied in terms of exhaustion and cynicism in a normal situation to better understand the level of exhaustion and cynicism in each learning profile in a normal situation since the analyses of changes had been conducted using Z-scores. Our examination of a normal situation showed that students representing the all high profile experienced the most exhaustion in their studies, whereas students representing the unorganised and unreflective profile experienced the most cynicism with respect to their studies during a normal situation. Students' level of exhaustion and cynicism based on the different learning profiles during a normal situation is presented in Table 3.

**Table 3.** Differences in exhaustion and cynicism, according to the profiles, during normal situations.

	C1. Unorganised and Unreflective Students (N = 103)	C2. Deep and Unorganised Students (N = 205)	C3. Students Representing Deep Approach (N = 221)	C4. All High Students (N = 136)	Total
	M (sd)	M (sd)	M (sd)	M (sd)	M (sd)
Exhaustion	3.19 (1.04)	2.86 (1.02)	2.59 (1.03)	3.46 (1.14)	2.93
Cynicism	2.73 (1.22)	2.17 (1.13)	1.62 (0.82)	2.14 (1.16)	2.07

Tuckey's Test. Exhaustion 1 > 2 \*, 1 > 3 \*\*\* 4 > 2,3 \*\*\*. Cynicism 1 > 2,3,4, \*\*\*, 3 < 2,4 \*\*\*. \*  $p < 0.05$ . \*\*  $p < 0.01$ . \*\*\*  $p < 0.001$ .

Next, we examined how students with different learning profiles experienced a normal situation in relation to the COVID-19 pandemic to answer the second research question. The differences in students' experiences with the teaching–learning environment were generally in line with the results for the whole sample. All the scales measuring experiences with the teaching–learning environment were statistically significantly lower during the COVID-19 pandemic than during a normal situation. Interestingly, the level of exhaustion varied in the different learning profiles. Deep and unorganised students exhibited a statistically significant increase in exhaustion, whereas all high profile students exhibited a statistically significant decrease in exhaustion. Moreover, students in the deep and unorganised profile had statistically significantly higher scores for the unreflective approach than did those in other student profiles. The results are presented in Table 4.

**Table 4.** The differences in approaches to learning, perceptions of teaching–learning environment and burnout (C1 = unorganised and nonreflective students; C2 = deep and unorganised students; C3 = students representing deep approach; and C4 = all high students).

	C1		C2		C3		C4	
	Normal	COVID	Normal	COVID	Normal	COVID	Normal	COVID
	M (sd)	M (sd)	M (sd)	M (sd)	M (sd)	M (sd)	M (sd)	M (sd)
Unreflective approach	3.10 (0.55)	3.03 (0.95)	2.20 (0.41)	2.48 *** (0.92)	2.06 (0.40)	2.12 (1.04)	3.19 (0.47)	3.07 (1.04)
Organised studying	2.50 (0.52)	2.12 *** (1.01)	2.87 (0.44)	2.36 *** (1.06)	4.06 (0.40)	3.62 *** (1.04)	3.80 (0.39)	3.12 *** (1.17)
Deep approach	3.43 (0.56)	2.92 *** (0.97)	4.28 (0.44)	3.75 *** (0.88)	4.37 (0.43)	4.14 *** (0.68)	3.93 (0.49)	3.55 *** (0.86)

Table 4. Cont.

	C1		C2		C3		C4	
	Normal	COVID	Normal	COVID	Normal	COVID	Normal	COVID
	M (sd)	M (sd)	M (sd)	M (sd)	M (sd)	M (sd)	M (sd)	M (sd)
Alignment	3.35 (0.68)	3.05 *** (0.89)	3.58 (0.65)	3.12 *** (0.90)	3.90 (0.54)	3.54 *** (0.90)	3.44 (0.66)	3.18 ** (0.89)
Peer support	3.87 (0.72)	2.88 *** (1.22)	4.08 (0.70)	2.97 *** (1.12)	4.15 (0.65)	3.33 *** (1.17)	4.11 (0.67)	3.23 *** (1.15)
Interest and Relevance	3.50 (0.68)	3.11 *** (0.94)	3.90 (0.65)	3.51 *** (0.93)	4.23 (0.51)	3.90 *** (0.91)	3.92 (0.55)	3.71 ** (0.85)
Constructive feedback	2.94 (0.81)	2.35 *** (0.98)	3.18 (0.80)	2.46 *** (1.04)	3.56 (0.78)	2.94 *** (1.05)	3.38 (0.86)	2.75 *** (1.12)
Exhaustion (Z)	0.24 (0.95)	0.11 (0.97)	−0.11 (0.93)	0.02 * (1.00)	−0.30 (0.93)	−0.23 (1.01)	0.48 (1.03)	0.27 ** (0.92)
Cynicism (Z)	0.59 (1.08)	0.43 (1.01)	0.09 (1.01)	0.15 (0.98)	−0.40 (0.73)	−0.36 (0.90)	0.06 (1.04)	0.03 (0.99)

\*  $p < 0.05$ . \*\*  $p < 0.01$ . \*\*\*  $p < 0.001$ .

#### 4. Discussion

The present study has examined how students' experiences with the teaching–learning environment changed during the 2020 COVID-19 pandemic by comparing how students with different learning profiles experienced online teaching and learning before the pandemic and during the pandemic. First, the results show that four different learning profiles emerged from the data, which are in line with previous studies focusing on students' learning profiles (Asikainen et al. 2020; Fryer and Vermunt 2018). Second, the results concerning students' experiences with the teaching–learning environment are in line with earlier findings showing a decrease in how students experienced the teaching–learning environment (Kedra and Kaltsidis 2020; Petillion and McNeil 2020). Interestingly, when examining how students in different learning profiles experienced a normal situation and the COVID-19 pandemic, the findings show that students' experiences with the teaching–learning environment have been more negative during the COVID-19 pandemic regardless of learning profile. Students in each of the different profiles reported feeling that the alignment of aims and teaching methods had decreased, meaning that the methods used did not support the specific aims of teaching and learning. They also reported feeling that they have received less peer support and constructive feedback. Moreover, they stated that teaching has not been as interesting and relevant as it was before the COVID-19 pandemic. Concerning the learning aspect, students scored lower on the deep approach to learning, i.e., relating ideas and searching for evidence, and organised studying, i.e., time and effort management. This is in line with studies showing that students have had difficulties in scheduling their studies (Bdair 2021; Baticulon et al. 2021; Petillion and McNeil 2020). Still, it is important to note that students in the unorganised and unreflective profile had the most negative experiences with the teaching–learning environment as well as the lowest scores on the deep approach and in organised studying, which is in line with previous research findings that an unreflective approach is negatively related to positive experiences with the teaching–learning environment (Herrmann et al. 2017; Parpala et al. 2013; Richardson and Price 2003). Those students would have required more help from teachers to be able to form a bigger picture of the study content, see how different courses are linked to each other and receive help in managing their time and effort during the COVID-19 pandemic.

When focusing on changes in approaches to learning and the possible effects of such changes, students representing the deep and unorganised profile had higher scores for the unreflective approach, indicating that this group of students has experienced knowledge in a more fragmented manner (Lindblom-Ylänne et al. 2019) during the COVID-

19 pandemic. Interestingly, this group of students also exhibited an increase in the level of exhaustion when comparing a normal situation with the pandemic situation. A higher level of unreflective learning may well have increased their exhaustion level, as the risk of study-related burnout is positively related to the unreflective approach (Asikainen et al. 2020).

Students in the all high profile exhibited a decrease in exhaustion, which is interesting because they scored high on every approach to learning and also scored the highest with respect to exhaustion level. There may be several reasons for the relative decrease in exhaustion. Previous research implies that students with high scores in every approach may have difficulties in developing or changing their study strategies, even if aware that they are not the most efficient students (Lindblom-Ylänne 2003). In the case of students experiencing challenges in changing their approaches to learning, the COVID-19 pandemic may have decreased exhaustion levels among all high students in relation to other students because suddenly every student at the time had trouble in changing their study strategies to fit the new online learning environment. All high profile students may also have scored high on every approach because they experienced the learning environment as encouraging and used the unreflective approach to learning, although many would have liked to use a deep approach in their studying (Fryer and Vermunt 2018). During the COVID-19 pandemic, students in the all high profile may have adapted to the new learning environment more easily precisely because the situation was so exceptional, and this may have diminished their exhaustion level. It may also be that they benefitted from the freedom of studying and learning outside the classroom during the COVID-19 pandemic because the learning environment was much more flexible.

The present study suggests that especially in the light of wellbeing, students matching the deep unorganised profile would have required more support during the COVID-19 pandemic, when all teaching and learning shifted to an online context. Moreover, students matching the unorganised and unreflective profile reported having the most negative experiences with the teaching–learning environment and a lower level of organised studying during the COVID-19 pandemic. Students in these two profiles would require help in relating ideas and conceiving of the study content as a coherent whole during online teaching. In addition, they may benefit from guidance and support in developing their study practices, especially their time and effort management skills. One tool for supporting students' studying and wellbeing is an acceptance and commitment (ACT)-based intervention, which aims to promote students' psychological flexibility as a means of enhancing study progression and decreasing problems in studying (Asikainen 2018; Asikainen et al. 2018; Levin et al. 2017). An intervention combining both study skills and psychological flexibility has proven to help students develop their study skills as well as their wellbeing (Asikainen et al. 2019). Furthermore, to foster students' study skills, especially their organised studying skills, universities should instruct students in how to consciously structure and plan their learning (Holzer et al. 2021). For example, different assignments with deadlines are considered useful for scheduling studying and increasing motivation (Petillion and McNeil 2020). In promoting students' wellbeing through improving their sense of relatedness to and identification with the university, digital platforms could be used to enable online group work (Holzer et al. 2021). Especially the easy functions of social media can encourage students for social interaction and collaborative learning in online teaching (Al-Rahmi and Zeki 2017) and support facilitating discussions and solving problems together (Eid and Al-Jabri 2016). Students would then be able to reflect on their learning process and learning together in a group, which in turn could also help students to improve their reflective studying (Holzer et al. 2021). This could also enhance students' ability to relate ideas and understand the study content as a coherent whole, thus decreasing their unreflective approach. Another way to support students with an unreflective approach to studying would be to use an inventory to enhance their metacognitive awareness of their own learning processes and ways to self-monitor such learning (Backhaus and Liff 2007; Parpala and Lindblom-Ylänne 2012; Ruohoniemi et al. 2017).

Our study does contain some limitations. First, students' experiences with the COVID-19 situation were measured with ten items and no comparisons between the scales were conducted. The use of single items measuring one scale is risky, however justifiable in specific conditions, such as when including more than 50 participants in the study and having high Cronbach alpha scales (Diamantopoulos et al. 2012). In the present study, single items measuring students' experiences with the teaching–learning environment, their approaches to learning and study-related burnout have included robust scales with good reliability in many different contexts (e.g., Herrmann et al. 2017; Cheung et al. 2020; Parpala et al. 2010; Postareff et al. 2018; Ruohoniemi et al. 2017; Rytönen et al. 2012). In addition, the scale differences limited our ability to compare similarities, as the items measuring exhaustion and cynicism on the Likert scales were different in normal and COVID-19 situations. Thus, we could not measure a change in these aspects among all students. However, standardised scores like z-scores can be used in situations with different kinds of measures (Wang and Chen 2012), and this made it possible for us to compare how students with study profiles managed feelings of exhaustion and cynicism during a normal situation compared to the COVID-19 pandemic. Furthermore, our study only uses self-reported data from one measurement, which may affect the results, especially since no background information or other experiences with the COVID-19 pandemic were considered.

## 5. Conclusions

The present study has examined how university students with different learning profiles have experienced the teaching–learning environment (teaching and their learning) before the pandemic (normal situation) and during online studying as a result of COVID-19. Our results concerning the whole sample are very much in line with the findings presented in previous studies that online teaching during the COVID-19 pandemic has had a negative impact on how students schedule their studies and on their interactions with teachers and other students (Baticulon et al. 2021; Bdair 2021; Petillion and McNeil 2020). Interestingly, students with difficulties in managing their time and a fragmented knowledge base (unorganised and unreflective students) reportedly have experienced the teaching–learning environment most negatively before and during the COVID-19 pandemic compared to those with other learning profiles. Moreover, students with an intention to relate ideas but less ability at managing their time and effort (deep and unorganised students) have reportedly experienced more exhaustion during the COVID-19 pandemic than before it. The present study, thus, suggests that especially students representing the two profiles, unorganised and unreflective students and deep and unorganised students, would require help in relating ideas and conceiving of the study content as a coherent whole during online teaching. In teaching this could be supported using group work (interaction and discussion online), prior knowledge assignments and making it visible how courses and their aims are related to each other. In addition, students representing these profiles may benefit from guidance and support in developing their study practices, especially their time and effort-management skills. The present study has some limitations as it only uses self-reported data and single items measuring experiences during COVID-19 pandemic. However, the instruments are tested and validated in different contexts. Still, future research is needed to understand how these different profiles benefit from online peer support and, for example, online prior knowledge assignments and this would require data from their academic achievement. To sum, the present study, thus, suggests that it is just as important to support and acknowledge students' learning profiles and skills (time and effort management, ability to relate study content) as it is to develop the teaching–learning environment, especially an online teaching–learning environment.

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A.P.; project administration, A.P. All authors have read and agreed to the published version of the manuscript.

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