

University students' interest and burnout profiles and their relation to approaches to learning and achievement

Henna Asikainen^{*}, Juuso Henrik Nieminen, Jokke Häsä, Nina Katajavuori

Viikinkaari 11, PL 62, 00014, University of Helsinki, Finland

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ABSTRACT

School burnout has been studied extensively in schools but its relation to learning and studying processes at the university level is still an under-researched topic. The purpose of this study is to explore burnout and study interest profiles among university students and how these profiles differ according to approaches to learning, academic achievement and gender. The data were gathered from 538 first-year life science students. Five profiles combining students' interest and relevance and school burnout components were found. The results showed that students representing the *Exhausted and inefficient* and *Burned-out not interested* profiles scored higher on surface approaches to learning than students who experienced less burnout. In addition, burnout profiles differed according to the credits earned and study success. There were also differences in the gender distribution of the profiles, as women were overrepresented in the burnout and exhausted profile.

1. Introduction

Succeeding in today's demanding labour market requires excellent life-long learning skills and the ability to solve complex and multidisciplinary problems under heavy workloads and stress. At the same time, students' poor wellbeing is a serious concern in universities (Auerbach et al., 2018; Hunt & Eisenberg, 2010; Zivin, Eisenberg, Gollust, & Golberstein, 2009). Problems in student well-being such as prolonged stress may lead to burnout (May, Bauer, & Fincham, 2015; Salmela-Aro, Kiuru, Leskinen, & Nurmi, 2009). While school burnout has been studied widely in the school context, research in the university context is more limited. The experiences of school burnout comprising exhaustion, inadequacy and cynicism have been shown to exist even in the early stages of studying at the university level (Asikainen, Salmela-Aro, Parpala, & Katajavuori, 2020; Salmela-Aro & Read, 2017). In addition, experiences of burnout increase as studying proceeds, with female students forming a significant at-risk group for burnout (Salmela-Aro & Read, 2017). Mental health problems are associated with a range of study-related problems including lowered academic achievement and cognitive performance (Eisenberg, Golberstein, & Hunt, 2009; Hysenbegasi, Hass, & Rowland, 2005; May et al., 2015) and dropping out (Ishii et al., 2018), as well as lower educational aspirations and educational attainment at the higher education level (Salmela-Aro & Read, 2017).

In addition to burnout, students' learning and studying skills have been shown to play an important role in how students manage their studying (e.g., Asikainen, Parpala, Virtanen, & Lindblom-Ylänne, 2013; Hailikari & Parpala, 2014). Furthermore, the presence of interest may increase the likelihood of learners engaging in their learning and problem solving (Harackiewicz, Durik, Barron, Linnenbrink-Garcia, & Tauer, 2008; Renninger & Bachrach, 2015). However, students' learning and studying processes and their relation to burnout and interest have not been fully explored at the university level. This is surprising given that the way that students learn and study at university is related to their experiences of burnout (Asikainen, Salmela-Aro, Parpala, & Katajavuori, 2020; Heikkilä, Lonka, Nieminen, & Niemivirta, 2012). According to the demands-resources model (Salmela-Aro & Upadyaya, 2014; Schaufeli & Bakker, 2004) students' experiences of the resources and demands of the learning environment affect their experiences of burnout and motivation. Research has shown that students' approaches to learning are related to experiences of the demands of the teaching-learning environment (Parpala, Lindblom-Ylänne, Komulainen, Litmanen, & Hirsto, 2010) as well as their interest (Kyndt, Dochy, Struyven, & Cascallar, 2011). Moreover, interest has a direct effect on students' approaches to learning, especially when the experience of the workload is high (Kyndt et al., 2011). There is also evidence that approaches to learning are related to achievement and progress in their studying (Asikainen et al.,

^{*} Corresponding author.

E-mail addresses: henna.asikainen@helsinki.fi (H. Asikainen), juuso.nieminen@uef.fi (J.H. Nieminen), jokke.hasa@helsinki.fi (J. Häsä), nina.katajavuori@helsinki.fi (N. Katajavuori).

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2013; Asikainen & Gijbels, 2017; Hailikari & Parpala, 2014). For these reasons, we suggest that students' approaches to learning can have an effect on students' experiences of the demands and resources of the environment as well as on their motivation. Thus, it is important to explore the relation of students' learning and study processes, interest and experiences of burnout and to identify the at-risk students.

There is a need to explore a person-oriented approach to school burnout among higher education students (Salmela-Aro & Read, 2017) by simultaneously identifying the components of burnout and a positive attitude about studying (Moeller, Ivcevic, White, Menges, & Brackett, 2018). This is because research has shown that burnout risk is a multi-component phenomenon, and thus, students can show different configurations of burnout components, for example higher inadequacy but lower cynicism. In addition, burnout symptoms may be present both with very interested and dedicated students as well as with very unengaged students (Salmela-Aro & Read, 2017). Asikainen, Salmela-Aro, Parpala, & Katajauori, 2020 have shown a relationship between different study profiles and experiences of study burnout but the study did not consider students' interest or positive state of mind in studying or the fact that students can be very interested and exhausted at the same time. Interest in learning can support persistence and commitment in studying and in achieving one's goal (Hofer, 2010, Schunk and Pajares, 2005), while interest in different domains has been found to be negatively related to burnout (Korhonen, Tapola, Linnanmäki, & Aunio, 2016). Thus, the aim of this research is to explore students' interest and burnout profiles that can be identified among first-year university students and show how these profiles differ in terms of approaches to learning and study achievement. The present study also focuses on the viewpoint of gender as previous research has identified female students as an at-risk group for study-related burnout (e.g., Salmela-Aro & Read, 2017).

1.1. School burnout in the educational context

Research on burnout was originally conducted within the human services domain (Maslach & Jackson, 1984) and since then, burnout in the workplace has been widely studied. Burnout has also been studied in other domains and fields, job-related burnout being defined as comprising three components: emotional exhaustion, cynicism about work and reduced professional efficacy (Leiter & Maslach, 2016; Maslach, Schaufeli, & Leiter, 2001). Burnout also appears among university students (Salmela-Aro et al., 2009; Salmela-Aro & Read, 2017; Schaufeli, Martinez, Pinto, Salanova, & Bakker, 2002). Thus, studies concerning burnout have been conducted in educational settings and similar definitions related to schools and universities have emerged (Salmela-Aro et al., 2009; Salmela-Aro & Kunttu, 2010; Salmela-Aro & Read, 2017; Schaufeli, Bakker, Hoogduin, Schaap, & Kladiher, 2001), namely exhaustion, cynicism and study-related inadequacy. Exhaustion refers to feelings of being burdened or exhausted resulting from over-taxing work in studying; cynicism refers to 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). The terms study burnout (Salmela-Aro & Read, 2017) and study-related burnout (Asikainen, Salmela-Aro, Parpala, & Katajauori, 2020; Kuittinen & Meriläinen, 2011) have also been used to refer to school burnout in university settings.

In educational contexts, burnout has been found to be related to several negative consequences in studying. A recent review study with over 100,000 students found that all three components of burnout have a negative effect on academic achievement (Madigan & Curran, 2020). In schools, students who experience more burnout and cynicism are less engaged in schoolwork, have poorer achievement and value school life less (Tuominen-Soini & Salmela-Aro, 2014). In addition, all the aspects of burnout have been found to be negatively associated with students' dedication to their studying, vigour, and absorption among university

students (Salmela-Aro & Upadyaya, 2017). On the other hand, students who are engaged and experience less school burnout are more likely to continue to university after high school (Tuominen-Soini & Salmela-Aro, 2014).

1.2. Approaches to learning

The way students go about learning and studying may influence their wellbeing (Asikainen, Salmela-Aro, Parpala, & Katajauori, 2020). One way to explore students' learning and studying processes is the students' approaches to learning tradition (Asikainen & Gijbels, 2017; Lonka, Olkinuora, & Mäkinen, 2004). Students' approaches to learning are traditionally divided into *deep* and *surface* approaches to learning. Students who apply the deep approach to learning aim to understand the subject matter and apply meaningful learning strategies, such as critical thinking in learning, whereas students who apply a surface approach to learning concentrate on facts and memorising and hence struggle with a fragmented knowledge base (Asikainen & Gijbels, 2017; Lonka et al., 2004). A third approach to learning has also been identified: *organised studying* refers to time and effort management (e.g., Entwistle & McCune, 2004).

Approaches to learning have been found to be related to several aspects in studying. Research suggests that students who apply a surface approach to learning experience heavier workloads than students with a deep approach to learning (Kyndt et al., 2011; Trigwell, Ellis, & Han, 2012). In addition, students who apply a surface approach to learning systematically experience the teaching-learning environment more negatively than students who apply a deep approach to learning (Parpala et al., 2010). In addition, interest is related to approaches to learning. It has been shown that studying out of interest has a direct effect on approaches to learning through perceptions of workload in the sense that motivation has a positive effect on a deep approach and a negative effect on a surface approach when perceptions of the workload are high (Kyndt et al., 2011). Both motivational factors and approaches to learning have been found to be important predictors of student learning outcomes (Kember, Charlesworth, Davies, MacKay, & Stott, 1997). Based on previous research described below, we could assume that approaches to learning could also be related to experiences of burnout.

1.3. A person-oriented approach to school burnout

Person-oriented studies concerning burnout have been conducted in the higher education context either with only burnout or with burnout and engagement dimensions. When considering burnout profiles with three components, the resulting profiles usually emphasise several levels of overall burnout comprising low, average and high levels. For example, in an American sample with undergraduate students, four profiles were identified: 1) low burnout (13%), 2) below-average burnout (25%), 3) above-average burnout (48%) and 4) high burnout (14%) (May, Rivera, Rogge, & Fincham, 2020). With a Korean sample of undergraduate students, four similar profiles were also found: 1) a distressed group (25%); 2) a laissez-faire group (33%) with low efficacy; 3) a persevering group (14%) with low exhaustion and cynicism; and 4) a well-functioning group (28%) (Lee et al., 2010). Burnout profiles have also been studied combined with measures of engagement which have shown different combinations of burnout and engagement. For example, a study in the higher education context with a representative sample of 12,394 students at different phases of their studying found four profiles: *Engaged* (44%), *Engaged-exhausted* (30%), *Inefficacious* (19%) and *Burnt-out* (7%) (Salmela-Aro & Read, 2017). Salmela-Aro and Read (2017) define engagement through dedication to studying, vigour and absorption and define the engagement as a positive state of mind towards studying. Similar profiles have also been found at high schools (Tuominen-Soini & Salmela-Aro, 2014). Although research about burnout which combines a positive state of mind and study processes is limited,

the previous research does indicate that study processes are related to students' well-being (Asikainen, Salmela-Aro, Parpala, & Katajaviuri, 2020; Heikkilä et al., 2012) and that interest also has an effect on students' approaches to learning through perceptions of workload (Kyndt et al., 2011). For this reason, we chose a person-oriented approach to explore profiles based on burnout components combined with interest and relevance.

1.4. Gender differences in experiencing burnout

Earlier research has shown that there are gender differences in how students experience burnout. Generally, it has been suggested that women experience more burnout symptoms and stress than men (Maslach et al., 2001), but differing results have also been found. A meta-analysis conducted in the work context showed that women tend to experience more exhaustion and men tend to experience more depersonalisation, taking the form of a negative and cynical attitude about work (Purvanova & Muros, 2010). In the educational context, gender has played a different role in different components of burnout. Women have been found to experience more exhaustion and inadequacy than men in higher education, but no gender differences were found in experiences of cynicism (Salmela-Aro & Read, 2017), in contrast with the study by Purvanova and Muros (2010) in the work context. However, a longitudinal study conducted with adolescents from the beginning of comprehensive school to high school showed that school burnout was highest among girls in the academic track, whereas with boys in the academic track, their experiences of all the components of burnout increased more than that of girls (Salmela-Aro & Tynkkynen, 2012). Based on these studies, it can be suggested that especially in the university context, experiences of burnout can be intense, and that there are gender differences in how the different components of study-related burnout are experienced. However, gender distributions in different burnout profiles have not been investigated in other studies; therefore, one of the aims of the present study is to explore how different profiles are distributed between genders.

2. The present study

Taken together, there is a gap in research concerning the relationship between students' learning processes, interest and burnout. Person-oriented research on burnout is needed (Salmela-Aro & Read, 2017) to capture how this relationship is manifested within different students. According to the demand-resources model (Salmela-Aro & Upadyaya, 2014; Schaufeli & Bakker, 2004), an imbalance between demands and resources can lead to burnout. In the present study, we expect that the way university students study and learn will have an effect on their perceptions of the demands of the environment.

Earlier studies have shown that students who apply a surface approach to learning experience heavier workloads and have systematically more negative perceptions of the teaching-learning environment than students with a deep approach to learning (Kuittinen & Meriläinen, 2011; Kyndt et al., 2011; Trigwell et al., 2012). In addition, we suggest that applying a deep approach to learning and organised studying can also act as a personal resource and through interest, lower the risk of burnout. This is because a deep approach and organised studying are positively related to perceptions of the teaching-learning environment (Parpala et al., 2010), interest (Kyndt et al., 2011) and negatively related to burnout (Asikainen, Salmela-Aro, Parpala, & Katajaviuri, 2020) and experienced workload (Kyndt et al., 2011). Earlier studies have also found a connection between study skills, interest and exhaustion, showing that a lack of regulation skills is related to students' experiences of high levels of stress, exhaustion and lack of interest in studying (Heikkilä et al., 2012; Heikkilä & Lonka, 2006). Thus, it could be expected that students with different interest and burnout profiles in different disciplines would apply different learning processes.

Our first hypothesis (H1) was that burnout, approaches to learning,

interest and academic achievement are related to each other. We expect school burnout to be negatively related to academic achievement as shown in previous studies (e.g., Madigan & Curran, 2020; Seibert, Bauer, May, & Fincham, 2017), and a surface approach to learning to be positively related to school burnout (Asikainen, Salmela-Aro, Parpala, & Katajaviuri, 2020; Kyndt et al., 2011). The second hypothesis (H2) was that we would find profiles among students that emphasise different components of interest and burnout in line with earlier studies on engagement and burnout in educational contexts (Salmela-Aro et al., 2017; Tuominen-Soini & Salmela-Aro, 2014). Our third hypothesis (H3) was that the different interest and burnout profiles would differ according to students' approaches to learning and academic achievement. Earlier studies have shown that a surface approach to learning is positively related to components of study burnout at the university level (Asikainen, Salmela-Aro, Parpala, & Katajaviuri, 2020) as well as experiences of high workload and negatively related to interest (Kyndt et al., 2011). In addition, different components of school burnout are related to academic achievement (Madigan & Curran, 2020). Finally, the fourth hypothesis (H4) was that we expect women to be more represented in profiles that emphasise exhaustion and inadequacy (e.g., Salmela-Aro & Read, 2017).

3. Methods

3.1. Participants

The participants in this study were 538 first-year students studying Life Sciences at a large Finnish university. These students, who started studying at university in autumn 2017, completed a research-based survey instrument called the HowULearn questionnaire (Parpala & Lindblom-Ylänne, 2012), and voluntarily gave permission to use their data in this study in spring 2018. In 19 responses, there were multiple missing values in items concerning approaches to learning as well as burnout, and these participants were deleted from the data. Thus, the final dataset consisted of 519 students (122 male students, 397 female students). No missing values were found among these students. They were from four faculties: Biological and Environmental Sciences ($N = 132$, 22 male, 110 female), Veterinary Medicine ($N = 66$, 7 male, 59 female), Pharmacy ($N = 67$, 15 male, 52 female), and Agriculture and Forestry ($N = 254$, 78 male, 176 female). The response rate in Biological and Environmental Sciences was 75%, in Pharmacy 42%, in Veterinary medicine 94%, and Agriculture and Forestry 74%. These disciplines all represent Life Sciences and were chosen because students in these disciplines have been shown to have problems with time management (Parpala et al., 2010), processes of understanding (Nieminen, Lindblom-Ylänne, & Lonka, 2004; Varunki, Katajaviuri, & Postareff, 2015), and workload (Ruohoniemi, Parpala, Lindblom-Ylänne, & Katajaviuri, 2010).

3.2. Measurements

The data for this study were gathered using a HowULearn questionnaire (Parpala & Lindblom-Ylänne, 2012). Students' approaches to learning were measured with a three-scale section of the HowULearn questionnaire measuring deep approach to learning (four items), surface approach to learning (four items), and organised studying (four items) with a 5-point Likert scale (1 = totally disagree, 5 = totally agree). The other section from the HowULearn questionnaire used in the present study is called the Study Burnout Inventory (SBI-9), which was based on the school burnout questionnaire (Salmela-Aro et al., 2009) for measuring study burnout, comprising exhaustion (four questions), inadequacy (two items) and cynicism (three items), and applied in a university context (see Salmela-Aro & Read, 2017) with a 6-point Likert scale (1 = totally disagree, 6 = totally agree). Interest was measured with the Interest and Relevance scale (1 = totally disagree, 5 = totally agree) from the HowULearn questionnaire (Parpala & Lindblom-Ylänne,

2012). The Interest and Relevance scale with three items measures positive experiences of studying, such as interest, enjoyment and meaningfulness in studying (the items: “I enjoy participating in courses,” “I can see the relevance of what we have been taught,” and “I find most of what I learnt in courses really interesting”). Sample items of the measures can be seen in Table 1. Study success was measured by using grade point averages (GPA) from the first academic year. Study progression was measured with the number of credits (ECTS, European Credit Transfer and Accumulation System) students received during their first academic year. A total of 60 ECTS credits are the equivalent of a full year of study.

3.3. Analyses

Confirmatory factor analysis (CFA) was conducted on the items measuring students' approaches to learning and study-related burnout together with interest and relevance. The fit for the model was based on the Comparative Fit Index (CFI) and the Root Mean Square Error of Approximation (RMSEA) (Hu & Bentler, 1999). A person-oriented analysis was conducted in this study using latent profile analysis (LPA) (Goodman, 1974; Lazarsfeld & Henry, 1968) using Mplus 8.0. LPA was conducted on the average scores of the scales of study-related burnout (three factors: *exhaustion*, *cynicism about the meaningfulness of studying*, and *sense of inadequacy as a student*) and *interest and relevance* (following the procedure by Tuominen-Soini & Salmela-Aro, 2014).

Six fit indices were used to compare which profile solution would explain the data best: the Akaike Information Criterion (AIC; Akaike, 1987), the Bayesian Information Criterion (BIC; Schwarz, 1978), the BIC Sample-Size Adjusted (aBIC), the Vuong-Lo-Mendell-Rubin Likelihood Ratio Test and the Lo-Mendell-Rubin Adjusted Likelihood Ratio Test (LMR LRT; Lo, Mendell, & Rubin, 2001). We also conducted the entropy measure of classification uncertainty. Entropy with values approaching 1.0 indicates a clear delineation of clusters, and it has been suggested that values over 0.70 refer to an acceptable level of entropy in educational studies (Jung & Wickrama, 2008). Finally, the size of the smallest profile was considered in the analysis, as well as the overall interpretability of the profile solution based on previous research on study-related burnout.

Several ANOVAs were conducted to investigate differences between profiles in students' approaches to learning as well as academic achievement. Each dependent variable was considered separately, and only the profile was used as an independent factor. Eta squared was used as a measure of effect size. Normality and homogeneous variance assumptions were checked before analysis. With one dependent variable (deep approach), Levene's test for homogeneous variance was significant ($p < .01$), and in this case, Welch's correction was used to calculate the F -value. The p -values for the F -tests were adjusted for multiple ANOVAs using Bonferroni adjustment (i.e., they were multiplied by 5). Pairwise post hoc comparisons were conducted using Tukey's HSD test and confirmed with t -tests. Again, Bonferroni correction was used to adjust the p -values.

Table 1
Sample items of the scales.

Measure	Sample item
Deep approach	I look at evidence carefully to reach my own conclusion about what I'm studying.
Surface approach	Much of what I've learned seems no more than unrelated bits and pieces.
Organised studying	I carefully prioritise my time to make sure I can fit everything in.
Exhaustion	I feel overwhelmed by the work related to my studies.
Cynicism	I'm continually wondering whether my studies have any meaning.
Inadequacy	I often have feelings of inadequacy in my studies.
Interest and relevance	I find most of what I learned in courses really interesting.

4. Results

The CFA concerning school burnout and interest and relevance was conducted with four dimensions measuring different aspects of burnout, namely 1) Exhaustion, 2) Cynicism and 3) Inadequacy and 4) Interest and Relevance. This model was found acceptable ($\chi^2 = 174,29$, $df = 48$ $p < .001$, CFI = 0.955, RMSEA = 0.071). Thus, four averaged scales were constructed from the items measuring exhaustion: 1) Exhaustion ($\alpha = 0.81$), 2) Cynicism ($\alpha = 0.84$) 3) Inadequacy ($\alpha = 0.72$) and 4) Interest and Relevance ($\alpha = .78$). The model for approaches to the learning fit for the three-factor model was acceptable ($\chi^2 = 195,8$, $df = 50$, $p = .001$, CFI = 0.923, RMSEA = 0.075), and corresponding averaged scales were constructed (Deep approach, $\alpha = 0.80$; Surface approach, $\alpha = 0.73$; Organised studying, $\alpha = 0.70$).

4.1. Correlations between variables in the study

Pearson's correlation coefficients were computed between all variables in the study (0.10 = small correlation, 0.30 = medium correlation, 0.50 = large correlation; Cohen, 1988). Coefficients are reported in Table 2. All measured components were related to each other as hypothesised (H1). All three burnout dimensions correlate positively with each other and negatively with the interest and relevance variable. All three dimensions of burnout correlate positively with the surface approach to learning, and cynicism and inadequacy correlate negatively with the deep approach to learning and organised studying. In addition, inadequacy and exhaustion correlate negatively with GPA and all the components of burnout correlate negatively with study credits. The deep approach to learning and organised studying correlates positively with GPA and study credits, and the surface approach to learning correlates negatively with both. Other correlations and details are shown in Table 2.

4.2. Finding the profile solution

The fit indexes favoured slightly different profile solutions (see Table 3). While AIC and BIC indicated that increasing the number of the profiles up to eight would increase the quality of the profile solution, VLMR and LMR LRT indicated that increasing their number would only lead to a relationally better solution up to five profiles, excluding the solution with four profiles. The five-profile solution demonstrated a significantly improved fit over the four-profile solution (VLMR = -2436.20 , $p < .05$; LMR LRT = 80.571 , $p < .05$). The entropy level of classification favoured a solution with five or more profiles. Finally, the five-profile solution was chosen to represent the best fit to the data and was in line with our second hypothesis.

Each of the student profiles is shown in Table 4. The largest of the profiles consisted of 180 students. In this profile, the students scored substantially lower on all factors of study-related burnout and highest on interest and relevance. We named this profile *Interested not burned-out students*. The second largest of the profiles consisted of 162 students. These students scored quite high on interest and relevance and higher than average on exhaustion and on inadequacy, and thus we named this profile *Interested-inefficient students*. We named the third profile *Slightly interested and cynical students*, and it consisted of 55 students. These students scored high on cynicism and lower than average on exhaustion and inadequacy. These students also scored lower than average on interest and relevance. The fourth profile was *Exhausted and inefficient students* and it consisted of 92 students. These students scored higher than average on exhaustion and on inadequacy. In the fifth profile ($N = 30$), the students' scores on every aspect of study-related burnout were very high and their score in interest and relevance was low, and thus this profile was named *Burned-out not interested students*. The description of the burnout as well as interest and relevance dimensions is relative to the sample average and not the scale anchors.

Table 2

Means, standard deviations, and Cronbach's alpha coefficients of the study variables (on the diagonal), as well as Pearson's correlation coefficients between them (above the diagonal).

	M	SD	α	CY	INA	IR	DA	SA	OS	GPA	SC
Exhaustion (EX)	2.55	0.94	0.81	0.33***	0.60***	-0.16***	-0.05	0.46***	-0.03	-0.12**	-0.10*
Cynicism (CY)	1.91	0.96	0.84		0.52***	-0.55***	-0.21***	0.35***	-0.33***	-0.06	-0.16***
Inadequacy (INA)	2.87	1.14	0.72			-0.33***	-0.25***	0.57***	-0.30***	-0.23***	-0.18***
Interest and relevance (IR)	3.87	0.69	0.78				0.41***	-0.36***	0.35***	0.12**	0.10*
Deep approach (DA)	3.74	0.79	0.80					-0.37***	0.33***	0.18***	0.10*
Surface approach (SA)	2.62	0.72	0.73						-0.19***	-0.30***	-0.12**
Organised studying (OS)	3.22	0.79	0.70							0.180***	0.23***
Grade point average (GPA)	3.22	0.88								-	0.27***
Study credits (SC)	29.3	9.58									-

*** p < .001.

** p < .01.

* p < .05.

Table 3

Fit indices for the profile solutions.

	2 profiles	3 profiles	4 profiles	5 profiles	6 profiles	7 profiles	8 profiles
AIC	5143.762	5004.498	4918.406	4845.257	4790.599	4737.450	4689.687
BIC	5199.037	5081.032	5016.199	4964.310	4930.912	4899.022	4872.519
aBIC	5157.772	5023.896	4943.193	4875.432	4826.163	4778.403	4736.028
VLMR	-2766.264	-2558.881	-2484.249	-2436.203	-2394.628	-2362.300	-2330.725
<i>p</i> _{VLMR}	0.0000	0.0013	0.2741	0.0156	0.2908	0.1845	0.3379
LMR LRT	401.910	144.637	93.113	80.571	62.653	61.192	55.973
<i>p</i> _{LMR LRT}	0.0000	0.0016	0.2830	0.0171	0.3009	0.1913	0.3436
Entropy	0.813	0.741	0.789	0.800	0.826	0.848	0.864
Smallest profile (N)	159	105	40	30	21	16	11

Table 4

Final cluster centres.

	N	Exhaustion		Cynicism		Inadequacy		Interest & relevance	
		M	SD	M	SD	M	SD	M	SD
Interested not burned out students	180	1.82	0.55	1.22	0.35	1.72	0.55	4.28	0.49
Interested-inefficacious students	162	2.90	0.79	1.48	0.40	3.33	0.64	4.00	0.50
Slightly interested and cynical students	55	2.20	0.56	2.79	0.48	2.44	0.60	3.21	0.69
Exhausted and ineffacious students	92	3.31	0.78	2.70	0.46	4.15	0.55	3.52	0.54
Burned-out not interested students	30	3.28	1.13	4.34	0.51	4.20	0.74	2.97	0.87

4.3. Differences in approaches to learning and academic achievement between profiles

ANOVA revealed statistically significant differences between the profiles in students' deep approach ($F(4, 514) = 13.06, p < .001$), surface approach ($F(4, 514) = 45.37, p < .001$) and organised studying ($F(4, 514) = 17.89, p < .001$), as well as the current year's GPA ($F(4, 514) = 5.98, p < .001$) and the number of study credits obtained ($F(4, 514) = 6.55, p < .001$), as was hypothesised (H3). All *p* values were adjusted with the Bonferroni method. Effect sizes measured with eta squared were large for the surface approach ($\eta^2 = 0.26$), medium for the deep approach ($\eta^2 = 0.09$) and organised studying ($\eta^2 = 0.12$), and small for GPA ($\eta^2 = 0.04$) and study credits ($\eta^2 = 0.05$). (See Cohen (1988) for interpretation of effect sizes).

Pairwise post hoc comparisons showed that *Interested and not burned-out students* scored higher on deep approach than students in the other profiles ($d = 0.52-0.86$). With surface approach, *Burned-out not interested students* and *Exhausted and ineffacious students* generally scored higher than students in the other profiles ($d = 0.60-1.70$), however, there was no statistically significant difference between *Slightly interested and cynical students* and *Exhausted and ineffacious students*. Moreover, *Interested-inefficacious students* scored higher on surface approach than *Interested not burned-out students* ($d = 0.90$), and *Slightly interested and cynical students* scored higher than *Interested not burned-out students* ($d = 0.64$). Concerning organised studying, *Interested not burned-out students*

scored higher than *Burned-out not interested students*, *Exhausted and ineffacious students* and *Slightly interested and cynical students* ($d = 0.71-1.10$). Similarly, *Interested-inefficacious students* scored higher in organised studying than *Burned-out not interested students*, *Exhausted and ineffacious students* and *Slightly interested and cynical students* ($d = 0.53-0.92$).

With academic achievement, the post hoc tests had weaker statistical significance. Both *Slightly interested and cynical students* and *Interested not burned-out students* enjoyed a higher GPA value than *Exhausted and ineffacious students* ($d = 0.44-0.59$). Finally, concerning study credits, *Interested and not burned-out students* had a higher value than *Exhausted and ineffacious students* ($d = 0.55$), and *Interested-inefficacious students* had a higher value than *Exhausted and ineffacious students* ($d = 0.47$) (see Table 5).

4.4. The distribution of profiles according to gender

The distribution of male and female students in different profiles was inspected and the results can be seen in Table 6. A chi-squared test revealed that the profile distribution differed statistically significantly between genders ($\chi^2 = 20.33, p < .001$). After the test, standardised z-scores (Agresti, 2007) for each gender-profile combination were compared to the critical value of 2.8 (corresponding to the Bonferroni-adjusted alpha level of 0.005). Notably, male students were found to be overrepresented in the profile *Interested not burned-out students*

Table 5

Results of the analyses of variance and post hoc comparisons between profiles, conducted separately on all approaches to learning and academic achievement variables. The profiles include Interested and not burned out students (IS), Interested-inefficacious students (IIS), Exhausted and inefficacious students (EXINS), Slightly interested and cynical students (ICS), Burned-out not interested students (BS).

	IS (N = 180)		IIS (N = 162)		EXINS (N = 92)		ICS (N = 55)		BS (N = 30)		F(4, 514) ^a	η ²
	M	SD	M	SD	M	SD	M	SD	M	SD		
Deep approach ^b	4.02	0.64	3.69	0.63	3.56	0.69	3.45	0.84	3.47	0.62	13.06***	0.09
Surface approach	2.18	0.58	2.73	0.64	3.11	0.61	2.55	0.59	3.24	0.85	45.37***	0.26
Organised studying	3.47	0.74	3.33	0.73	2.86	0.75	2.95	0.70	2.64	0.84	17.89***	0.12
GPA	3.38	0.91	3.09	0.80	2.99	0.87	3.51	0.92	3.06	0.78	5.98***	0.04
Credits	31.22	9.82	30.24	8.86	25.90	9.66	27.77	8.41	26.10	10.14	6.55***	0.05

Post hoc comparisons (Tukey HSD, Cohen's *d* in parentheses as effect size):

Deep approach: ***: IS > ICS (0.81), IS > EXINS (0.70), IS > IIS (0.52); **: IS > BS (0.86).

Surface approach: ***: BS > IS (1.70), BS > ICS (1.00), EXINS > IIS (0.60), EXINS > IS (1.56), IIS > IS (0.90); **: BS > IIS (0.75), ICS > IS (0.64).

Organised studying: ***: IS > BS (1.10), IS > EXINS (0.82), IS > ICS (0.71), IIS > BS (0.92), IIS > EXINS (0.64); *: IIS > ICS (0.53).

GPA: *: ICS > EXINS (0.59), IS > EXINS (0.44).

Credits: ***: IS > EXINS (0.55); *: IIS > EXINS (0.47).

* $p < .05$, ** $p < .01$, *** $p < .001$; Bonferroni adjustment applied to p values.

^a Welch correction was applied to deep approach because of unequal variances, with $df = 135.59$ in the denominator.

Table 6

Distribution of the profiles according to gender.

	Males		Females	
	N	%	N	%
Interested not burned out students	60	49.2%	120	30.2%
Interested-inefficacious students	25	20.5%	137	34.5%
Exhausted and inefficacious students	18	14.8%	74	18.6%
Slightly interested and cynical students	16	13.1%	39	9.8%
Burned-out not interested students	3	2.5%	27	6.8%
All	122	100%	397	100%

(49.2% of all males, 60 students, $z = 3.8$), as only 30.2% (120 students) of females belonged to this profile. On the other hand, female students were overrepresented in the *Interested-inefficacious* profile (34.5% of all females, 137 students, $z = 2.9$) with only one-fifth (20.5%, 25 students) of the male students representing this category. In the other profiles, differences were not statistically significant (see Table 6).

5. Discussion

The purpose of this study was to explore university students' interest and burnout profiles and their relationship to students' learning and study processes and reflect these results against the resource-demands model. This study also aimed to respond to how the genders are distributed in the profiles.

Considering the relations between the study variables (H1), we found that all the components of burnout were negatively related to study progression, and exhaustion and inadequacy were negatively related to academic achievement. Our results are in line with previous studies that have shown that study-related burnout is negatively related to academic achievement (e.g., Madigan & Curran, 2020; Seibert et al., 2017). In addition, our results showed that all components of study-related burnout and the surface approach were positively related, and the deep approach and organised studying were positively related to interest and relevance. Further, organised studying and a deep approach were negatively related to cynicism and inadequacy, but no relation to exhaustion was found. This result is in line with our hypothesis, as earlier studies have found that a surface approach to learning is related to perceptions of inappropriate workload (Kyndt et al., 2011), stress and lack of motivation (Heikkilä & Lonka, 2006), interest (Kyndt et al., 2011) as well as study-related burnout (Asikainen, Salmela-Aro, Parpala, & Katajavuori, 2020). Thus, the high positive correlation between the surface approach and components of burnout is in line with the demands-resources model as students applying a surface approach often

have problems in their study skills and can thus experience the demands of the environment more strongly.

Our second hypothesis (H2), namely that we would identify profiles among university students that emphasise different components of interest and burnout, was also confirmed. The Burned-out not interested profile and the Interested not burned-out profile as well as the Interested-inefficacious profile proved to be similar to the profiles found in previous education-related studies (Salmela-Aro & Read, 2017; Tuominen-Soini & Salmela-Aro, 2014), namely Burned-out students, Engaged students and Engaged-exhausted students. In our study, the Exhausted and inefficacious students' profile was similar to Burned-out not interested students, but the former scored higher on cynicism. Thus, in our study high burnout scores were divided into two similar profiles, slightly cynical and more cynical. In addition, we found a profile that we described as Slightly interested and cynical students in which students scored slightly higher on cynicism but not so high on other components of burnout. This kind of profile has not been found in other educational context studies (Salmela-Aro & Read, 2017; Tuominen-Soini & Salmela-Aro, 2014), but it resembled the Disengaged profile found by Leiter and Maslach (2016) in a workplace context. One reason for discovering this profile of Slightly interested and cynical students could be that many students experience uncertainty about their future and employment (Myllyniemi, 2016). This uncertainty about the future can cause feelings of cynicism while studying. In addition, it has been shown that cynicism can be experienced higher in polytechnics, which is more occupation-based training than studying at university (Salmela-Aro & Read, 2017). However, in our sample, students representing slightly interested and cynical students were less represented in professional fields. Thus, there is a need to explore this further in future research.

Our results are worrying since nearly a quarter of the first-year students (23.5%) represented either Burned-out not interested or Exhausted and inefficacious students. In addition, over 30% of the students represented the Interested-inefficacious profile in which experiences of exhaustion and inadequacy were rather high. In a study by Salmela-Aro and Read (2017), the percentage of students in the engaged-exhausted profiles was also 30% but that of burned-out students was only 7%. However, our overall means of the burnout components do not reflect very high burnout at a group level. In the study by Salmela-Aro and Read (2017), the overall means of exhaustion and inadequacy were lower, but cynicism was higher among first-year students than in our study. One reason for this can be that students in their first year usually do not experience as much burnout as students in later years (Salmela-Aro & Read, 2017). Furthermore, our study was conducted in Finland where studying in higher education might not be as stressful as in many other

countries (e.g. in Finland GPA has relatively little impact on study progress or on students' lives). Nevertheless, as a quarter of the students experience burnout symptoms, our findings raise concerns about how these students will cope with their forthcoming studying if they have already experienced study-related burnout in their first year. The number of engaged students in a study by Salmela-Aro and Read (2017) with low burnout was 44% but in our study it was only 35% (Interested not burned-out students). It seems that in our sample there are more students with higher experiences of the components of study-related burnout. One reason could be that in these programs, students report problems in their study skills (Nieminen et al., 2004; Ruohoniemi et al., 2010; Varunki et al., 2015).

Our results reinforce the third hypothesis (H3): different interest and burnout profiles differed according to students' approaches to learning and academic achievement. Overall, profiles which emphasised high inadequacy and exhaustion scored higher on the surface approach to learning and profiles in which interest was high scored higher on the deep approach to learning. This is in line with previous research suggesting that a deep approach to learning is positively related and a surface approach negatively related to interest in studying (Bolkan, Goodboy, & Griffin, 2011; Everaert, Opdecam, & Maussen, 2017; Coertjens, Vanthournout, Lindblom-Ylänne, & Postareff, 2016; Kyndt et al., 2011), and perception of the demands of the teaching-learning environment (Parpala et al., 2010; Richardson, 2005). Similar to a deep approach, it seems that organised studying is not particularly different between profiles emphasising different components of burnout, but in profiles where interest and relevance is emphasised, organised studying is higher. One reason for this could be that intrinsic motivation is positively related to time management and may help students to set and achieve their goals (Ryan & Connell, 1989; Sheldon & Elliot, 1998) and be a resource for their studying. It seems that exhaustion is less related to organised studying and the deep approach as there are students who experience exhaustion but can also have good study skills and manage their time well. However, previous research has suggested that time management has a negative relation to burnout (e.g., Peeters & Rutte, 2005). Thus, it seems that interest in studying is related to good time and effort management skills in studying as well as a deep approach to learning.

We found that Exhausted and Inefficacious students had a lower GPA than Interested not burned-out students and Slightly interested and cynical students. This suggests that the combination of exhaustion and inadequacy can be a bad combination for success in studies, and that cynicism does not determine the relationship between study-related burnout and academic achievement so much. In our sample, within the profiles where cynicism was high, the difference in study success was not statistically significant. This is an interesting finding, as previous studies have found a clear relationship between cynicism and academic achievement (Madigan & Curran, 2020; Shadid et al., 2020). Furthermore, our study showed that the combination of exhaustion and inadequacy may also have a negative effect on study progression. A negative relationship between components of study-related burnout and study progression has also been found in a previous study (Asikainen, Salmela-Aro, Parpala, & Katajavuori, 2020). However, interest seems to be also important component for study progression, as the combination of relatively high inadequacy and exhaustion combined with high interest seem to result in better study progression. Our findings imply that cynicism does not explain the differences in study progression as much as exhaustion and inadequacy. Previous studies have not explored study-related burnout and its relation to study progression to a large extent. One previous study suggests that cynicism in particular has an effect on dropping out (Bask & Salmela-Aro, 2013). Thus, this relationship should be further explored. Nevertheless, it seems that experiences of study-related burnout are related to study progression.

Our last hypothesis (H4) was that we expected to find an overrepresentation of women in profiles which emphasise exhaustion and inadequacy. Our results confirm this hypothesis, which showed that

male students were overrepresented in the profile Interested not burned-out students, and female students were overrepresented in the profile Interested-inefficacious students. Thus, it seems in the profiles where cynicism was lower, there were statistically significant differences between male and female students, but within the profiles where cynicism was higher, no gender differences were found. Research within educational contexts has found that women experience more exhaustion and inadequacy than men, but no gender differences were found in experiences of cynicism (Herrmann, Koeppen, & Kessels, 2019; Salmela-Aro & Read, 2017). A meta-analysis in the working life context (Purvanova & Muros, 2010) showed that women are more likely to be more emotionally exhausted than men, whereas men are more likely to be more cynical than women. Thus, Purvanova and Muros (2010) warn that there is a danger in considering that women are more prone to burn-out than men, because men's burnout experiences may go unrecognised. Our study also supports this view as in many profiles, no gender differences were found. Based on our results we could suggest that when considering interested students, women are more likely to experience exhaustion and inadequacy than male students.

However, further studies are needed to explore this theme in more detail, especially due to the findings in gender differences in experienced school burnout (May et al., 2015; Walburg, 2014). Further research should also explore the risk factors for burnout and if they differ between males and females. Our study indicates that it may be that the experience of cynicism or interest in studies can be issues of interest.

5.1. Limitations

There was a low response rate for some of the faculties. The low response rate, a common problem in research, may well have affected our results, especially because we do not have information about the students who did not respond. In addition, disciplinary differences could not be explored in our study due to the small sample sizes in some of the faculties although research has shown that experiences of the teaching-learning environment differ in different disciplines (Parpala et al., 2010). Furthermore, we used only self-report data in our study as well as one measurement time. In addition, the sample consisted of only first-year students in one university. It has been shown that students' experiences of study-related burnout and engagement are likely to change as they progress (Salmela-Aro & Read, 2017). Thus, a bigger sample of students from different levels of study would bring a clearer picture of the burnout levels and profiles of the students.

5.2. Theoretical and practical implications and suggestions for future research

Our results show that students with different burnout and interest profiles can apply different approaches to learning in their studying. According to the demands-resources model, the interplay between experienced demands and resources has an impact on experiences of burnout (e.g., Salmela-Aro & Upadaya, 2014). When considering our results within the demands-resources model, we suggest that deep approach and organised studying may act as a personal resource for students, which influences how they perceive the resources of the environment, and increase their interest. In addition, we also suggest that the surface approach to learning may affect the perceptions of the demands of the environment and thus, result in burnout symptoms (Fig. 1).

The level of personal resources is not focused on in great detail in the demands-resources model (Ventura, Salanova, & Llorens, 2015), although personal resources have shown to be important in coping with the demands of the environment (Salanova, Bakker, & Gumbau, 2006). Personal resources that refer to person-environment interplay, such as self-efficacy beliefs, have recently been studied within the model, and it has been shown that self-efficacy plays a key role in experiences of burnout and demands (Salmela-Aro & Upadaya, 2014; Xanthopoulou,

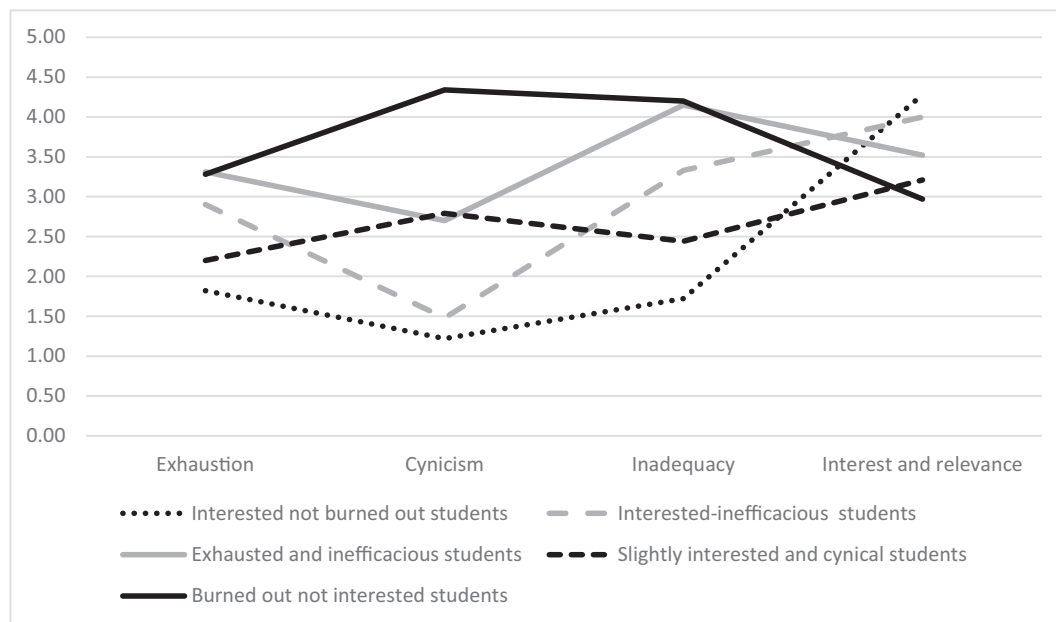


Fig. 1. Burnout and interest profiles.

Bakker, Demerouti, & Schaufeli, 2009), which is also in line with social cognitive theory (Bandura, 1997). In addition to self-efficacy, we suggest that a surface approach may also be a factor influencing students' experiences of burnout. However, our data did not test the demand-resources model as such, which could also be regarded as a limitation in our study. To examine this relationship more deeply, further general-level research with longitudinal data would be needed to test this model.

The relationship between experiences of burnout and approaches to learning can be bidirectional. Because exhaustion refers to feelings of being burdened, and cynicism refers to a cynical or indifferent attitude, it is also possible that exhausted and cynical students may turn to surface learning as a coping device. However, a surface approach to learning may also lead to experiences of demands in the environment and to burnout. One may also hypothesise that a deep approach to learning might reduce cynicism, because in a deep approach students' own interest in studying a subject is present (Bolkan et al., 2011; Everaert et al., 2017). Organised studying and a deep approach to learning could be enhanced by modifying the teaching-learning environment and assessment to support students' active role in their own learning process (Biggs & Tang, 2007), and further, our results suggest that by modifying the teaching-learning environment to decrease surface approach to learning, we could also have a positive effect on student wellbeing. Therefore, more research into cause-effect relationships should be conducted to help students tackle these problems.

Concerning practical implications, it is important that university teachers recognise the relation between learning processes and the study-related burnout experienced and would develop their teaching in a way which would encourage students to improve their study skills and thus reduce surface approach to learning. Through changes in the learning environments, it is possible to enhance students' learning approaches towards a deep approach and decrease their surface approach (Hall, Ramsay, & Raven, 2004; Nieminen, Asikainen, & Rämö, 2021; Takase, Niitani, & Imai, 2020). Teachers should encourage students to engage in activating teaching and assessment methods, along with providing relevant knowledge and demonstrating enthusiasm and support for students' learning (Takase et al., 2020). However, it is also important to consider the workload of courses because perceived workload is associated with a surface approach to learning (e.g., Struyven, Dochy, Janssens, & Gielen, 2006). Thus, enough time should be allocated for students to process and learn the course material to

foster deep-level learning and to prevent burnout. Students' own interest in their studying should also be facilitated, such as by cooperative learning or problem-based learning (Everaert et al., 2017) or active assessment methods (Nieminen et al., 2021) with the goal of promoting and facilitating students' doing, thinking, and active processing of the study content (Grocchia, 2018; Takase et al., 2020). Active learning and processing can diminish students' surface level processing and in turn lead to better wellbeing. Thus, it is possible to take into consideration students' wellbeing as well as their ways of studying by modifying one's teaching to promote students active learning with others.

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