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Effects of Study-Integrated Well-Being Course Intervention for Different Burnout and Engagement Profiles of University Students

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Abstract

As the increase in university students' mental health problems poses significant challenges to education, new research-based ways to support students' well-being in higher education are urgently needed. Acceptance and Commitment Therapy (ACT) has been shown to be effective in enhancing different aspects of well-being in a variety of contexts. Although study burnout has been shown to have detrimental impacts on students' well-being and studying, not much is known about the person-oriented features of burnout risk in relation to ACT-based intervention outcomes. The aim of this study was to compare the effects of an online ACT-based course on different aspects of university students' well-being and study ability in latent groups of students that had different levels of study burnout and engagement at the beginning of the intervention. The results of latent profile analysis (LPA) showed that students (N=352) represented four profiles at the beginning of the course: indifferent (37.8%), engaged (29%), engaged-inefficacious (13.6%), and burned-out (19.6%). The results of mixed ANOVA with repeated measures showed that psychological flexibility, well-being, study engagement and organised studying increased, and study burnout risk decreased in the whole sample of course-participating students. The changes in students' exhaustion, well-being, psychological flexibility, and organised studying did not differ between the four burnout and engagement profiles. The profiles differed in the changes of cynicism, inadequacy and engagement. The results of this study provide new knowledge of the person-oriented features of study burnout and indicate that ACT-based course interventions can be effective in enhancing different profiles representing university students' well-being.

Keywords: Study burnout; engagement; well-being; psychological flexibility; organised studying; university students

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1. Introduction

Higher education students' mental health problems have been a growing concern throughout recent decade (Auerbach et al., 2019), and during the COVID-19 pandemic, even more challenges for students' psychological well-being were reported (UNESCO, 2020). One key factor threatening students' well-being is study burnout, which has been shown to have detrimental effects also on students' academic aspirations (Salmela-Aro & Upadyaya, 2017), achievement (Madigan & Curran, 2021), and study engagement (Salmela-Aro & Upadyaya, 2014; Schaufeli, et al., 2002). Alongside psychological and behavioural disadvantages, burnout has also been shown to be related to higher prevalence of physical illness in the general population (Honkonen et al., 2006), and poorer physical health in university students (Pagnin, & De Queiroz, 2015). Given that burnout during studies has also been shown to be related to mental health issues, such as depressive symptoms (Salmela-Aro et al., 2009), developing study-integrated methods to mitigate the risk of study burnout is crucial. Different kinds of behaviour therapy interventions have been shown to be effective in reducing students' burnout but studied mainly with students of secondary and tertiary levels of education with initially high levels of burnout (Madigan et al., 2023). In recent decades, psychological flexibility - rooted in a cognitive behavioural therapy intervention Acceptance and Commitment Therapy (ACT) - has been demonstrated to be a crucial factor for well-being, health, and performance across various contexts (Hayes et al., 2006; Bond et al., 2013; Kashdan & Rottenberg, 2010; Räsänen et al., 2016). Earlier studies of interventions aiming to enhance students' psychological flexibility have for example shown to reduce students' burnout risk (Frögéli et al., 2016; Räihä et al., 2024), and to enhance students' well-being (Howell & Passmore, 2019), organised studying (Katajavuori et al., 2021; Räihä et al., 2024), and study engagement (Grégoire et al., 2018), but there has not been prior person-oriented research comparing the effects of interventions on different study burnout and engagement profiles of university students. Thus, to gain new knowledge of ways to prevent study burnout risk and to further develop study-integrated well-being-enhancing interventions that are useful to different burnout profiles representing university students, more research is needed on the person-oriented features of burnout risk (Salmela-Aro & Read, 2017), and differences in relation to intervention outcomes. In this study, we seek to face this gap in knowledge by examining university students' study burnout and engagement profiles, and the differences in their well-being, psychological flexibility, and organised studying after participating in an ACT-based course intervention aiming to enhance students' psychological flexibility and organised study skills.

2. Theoretical background

2.1 University students' well-being, burnout, and engagement

As well-being is a multi-faceted construct with many definitions and traditions (Dodge et al., 2012), university students' well-being can be conceptualised in many ways. According to Keyes's (2002) essential model of well-being, mental health manifests through various positive aspects of emotional, psychological, and social well-being, and is not indicated merely by the absence of mental illbeing. *Emotional well-being* can be viewed as presence of positive affect, absence of negative affect and perceived satisfaction with life (Keyes, 2002), as *psychological well-being* (Ryff, 1989), and *social well-being* (Keyes, 1998) refer to how individuals see themselves functioning and thriving in their personal and social life. University students' higher levels of mental well-being have been shown to be associated for example with lower levels of academic stress (Sarasjärvi et al., 2022). Longitudinal study-related stress can lead to depletion of students' well-being in the form of study burnout, which can be described as an overall construct of three dimensions of exhaustion, cynicism, and inadequacy (Maslach et al., 2001; Salmela-Aro, et al., 2009; 2022; Schaufeli et al., 2002). *Exhaustion* refers to feelings of strain and fatigue that follows overly burdensome study demands (Salmela-Aro & Read, 2017; Schaufeli et al., 2002). When faced with long-lasting exhaustion, one might react with emotional detachment and

by lowering the value of studies to them. This second dimension *cynicism* is manifested in an indifferent stance towards academic work, a loss of interest, and decreased feelings of meaningfulness in studying (Salmela-Aro & Read, 2017; Schaufeli et al., 2002). Finally, feelings of *inadequacy* and a lack of study-related efficacy refers to diminished feelings of achievement and productivity in one's studies (Maslach et al., 2001; Schaufeli et al., 2002). Previous studies in higher education have shown that, emotional exhaustion (Ríos-Risquez et al., 2018), and cynicism (Kachel et al., 2020; Pagnin & De Queiroz, 2015) are related to lower levels of students' psychological well-being. In addition, study-related exhaustion, cynicism, and inadequacy have been found to be related to depressive symptoms (Salmela-Aro et al., 2009), reduced academic achievement (Asikainen et al., 2022; Madigan & Curran, 2021; Salmela-Aro & Upadyaya, 2017), and to have detrimental effect on students' study engagement (Salmela-Aro & Upadyaya, 2014). Engagement, which was originally defined as a positive fulfilling work-related state of mind, refers to energy, dedication, and absorption (Schaufeli et al., 2002). In study context, engagement can be seen as a motivational process, and to have an emotional dimension referring to a positive approach and attitude towards studying (*energy*), cognitive dimension referring to perceiving schoolwork as meaningful (*dedication*), and behavioural dimension referring to concentration on and *absorption* in studying (Salmela-Aro & Upadyaya, 2012; Salmela-Aro et al., 2022). Study engagement has been found to predict students' emotional well-being (Salmela-Aro & Upadyaya, 2014), and to be related to academic success in higher education (Ketonen et al., 2016).

The multidimensional constructs of study burnout and engagement are related to each other, as well as different demands and resources (Bakker et al., 2023). Personal resources, such as socioemotional skills, adaptive coping strategies and performance capacity can promote students' engagement and prevent development of burnout risk (Salmela-Aro et al., 2022; Schaufeli & Taris, 2014). For example, organised studying, referring to students' ability to self-regulate and manage time and the tasks related to everyday studying (Entwistle & McCune, 2004), has been shown to be related to university students' lower study burnout risk (Räihä et al., 2024). Furthermore, students' better abilities to self-regulate studying have been shown to be related to academic success (Pérez-González et al., 2022), and higher levels of emotional, psychological, and social well-being (Davis & Hadwin, 2021; Howell, 2009). Earlier studies have shown that Acceptance and Commitment Therapy (ACT) -based interventions can improve all three components of well-being – emotional, psychological, and social well-being (Fledderus et al., 2010; Wersebe et al., 2018). The overall aim of ACT is to increase participants psychological flexibility, that refers to adaptive ability to be aware and open to diverse experiences, and to persist in behaviour that serves individuals valued objectives (Hayes et al., 2012). Psychological flexibility represents thus a personal resource that has been found to be an important factor for well-being and performance in several contexts (Bond et al., 2013; Hayes et al. 2006; 2012; Kashdan & Rottenberg, 2010; Onwezen et al., 2014), including higher education (Hailikari et al., 2022). Psychological flexibility has been traditionally conceptualised with six processes: acceptance (ability to experience or accept psychological events without creating the behavioural harm of trying to avoid experiences), defusion (ability to notice the act of thinking), self-as-context (ability to take perspective of self as opposite of rigid conceptualisation of self), present moment awareness (ability to direct attention flexibly to the present moment), values (ability to acknowledge one's values), and committed action (ability to engage and commit to valued behaviour) (Hayes et al., 2006). These six processes can be further conceptualised as three pillars or dimensions of psychological flexibility: openness to experience (acceptance and defusion), behavioural awareness (self-as-context and present moment awareness), and valued action (values and committed action) (Hayes et al., 2011).

Previous studies in higher education have shown, that ACT-based interventions decrease students' perceived stress (Katajavuori et al., 2021; Räsänen et al., 2016; Viskovich & Pakenham, 2020) and burnout risk (Frögéli et al., 2016; Räihä et al., 2024) and increase study engagement (Grégoire et al., 2018). In their systematic review and initial meta-analysis of the role of ACT-based interventions in promoting university students' well-being, Howell and Passmore (2019) found a small but significant pooled effect size on well-being of the five studies chosen for the analysis. As the research of effects of ACT-based interventions on study burnout is still quite scarce, there are yet no systematic reviews. However, in a recent systematic review of ACT for professional staff burnout, Towey-Swift and others

(2023) found that an ACT-based intervention reduced burnout symptoms of employees in nine of the 14 chosen studies. To summarise, psychological flexibility alongside organised studying can be seen as psychological resources, that can play a role in supporting students' adaptive capacity to answer different kind of demands during studies thus preventing the development of burnout risk, alongside promoting study engagement, and different dimensions of students' well-being.

2.2 Person-oriented features of study burnout and engagement

In the earlier burnout studies, the dimensions of engagement were seen to represent opposite of the dimensions of burnout (Maslach et al., 2001; Salmela-Aro & Upadyaya, 2012; Schaufeli et al., 2002). However, later studies have shown that engagement in studies does not necessarily mean that student has low study burnout risk (Salmela-Aro et al., 2016). As variable-centred approaches describe associations between variables, person-oriented approaches applying research aims to form patterns, clusters, or groups based on the differences among individuals in how variables are related to each other (Laursen & Hoff, 2006). Research that applies a person-oriented approach has shown that, when burnout is analysed together with other well-being constructs, different components are accentuated in different profiles (Mäkikangas & Kinnunen, 2016). In their person-oriented research of school burnout and engagement of high school students and young adults (n=979), Tuominen-Soini and Salmela-Aro (2014) found four profiles: engaged (44%), engaged-exhausted (28%), cynical (14%), and burned-out (14%). Later Salmela-Aro and Reid (2017) found similar profiles – engaged (44%), engaged-exhausted (30%), inefficacious (19%), and burned-out (7%) – in a person-oriented study of higher education students (n=12 394). As both elevated levels of engagement and different dimensions of study burnout can coexist in different profiles, this indicates that engagement and burnout are not merely contradictory phenomena and underlines the need to study them together (Salmela-Aro et al., 2016).

Research of employees participating in a mindfulness, acceptance, and value-based (MAV) intervention has shown that different profiles of burnout and mindfulness can differ in terms of changes in burnout risk, mindfulness skills (Kinnunen et al., 2019), and well-being (Kinnunen et al., 2020). To our knowledge, there has not been prior person-oriented research comparing the effects of ACT-based interventions on different study burnout and engagement profiles. The lack of previous research, and the notion, that study burnout profiles enable a more versatile picture of university students' burnout risk, underline the need to study latent subgroups of students who might benefit differently from the study-integrated ACT-based intervention according to the level of study burnout risk and engagement at the beginning of the intervention.

3. Present study

In this study, we aim to explore the changes in study engagement, burnout risk, well-being, psychological flexibility, and organised studying of different burnout and engagement profiles representing university students, who participate in a study-integrated ACT-based intervention course. First, we utilise a person-oriented approach to find out if what kind of latent groups students represent at the beginning of the course, and second compare the changes in outcomes at the end of the course between these profiles. Two research questions were formulated. RQ 1: What kinds of study burnout and engagement profiles do students represent at the beginning of the course? Based on previous burnout profile studies with students, we hypothesised that students represent profiles that differ in the levels of exhaustion, cynicism, inadequacy, and study engagement (Salmela-Aro et al., 2016; Salmela-Aro & Read, 2017). RQ 2: What kinds of changes in students' study burnout, engagement, organised studying, psychological flexibility, and well-being are found at the end of the course intervention, and do the changes differ between the profiles? To our knowledge, there has not been prior person-oriented research comparing the results of ACT-based interventions on different burnout profiles of students, but

based on research with employees, we set a hypothesis, that the profiles differ in terms of changes in burnout risk and well-being (Kinnunen et al., 2019; Kinnunen et al., 2020).

4. Methods

4.1 Participants and the procedure

The intervention was conducted as an optional online course (3 ECTS) that was offered for all students at the University of Helsinki. The overall aim of the course was to improve participating students' ability to identify individual factors related to their well-being and studying, and to learn to apply various psychological skills, such as the processes of psychological flexibility and skills related to organised studying. The online course included eight weeks of ACT-based exercises alongside time management, and study skills training that took place in online learning environment (Moodle) and Zoom (see Table 1). During the course, students were provided an opportunity to meet the teachers of the course in online meetings in Zoom at the beginning, at the middle (week 4), and at the end of the course (week 7). Otherwise, the instructions related to the course were provided in the learning environment in text and video formats. Alongside individual exercises, students participated in online group meetings, where they were given tasks and prompts to reflect together on the weekly themes. Students were required to submit their individual and group learning assignments to the learning environment weekly.

The first weeks of the course represented introduction to the content areas of the course, especially the concept of psychological flexibility, and values. Students were also given a time management task right at the beginning of the course, in which they followed their time usage for a week and observed for example the workload related to different activities. During these weeks students were for example given exercises, where they reflected the key values in their lives and set a goal for themselves for the course. The objective of weeks three, four and six was for the students to learn, practise and apply psychological skills related to key elements of psychological flexibility: openness to experiences (acceptance of thoughts and feelings, cognitive defusion) and behavioural awareness (present moment awareness, self-as-context). Week five consisted of content and exercises related to organised studying, study techniques and the role of health behaviours such as sleep, nutrition and exercising, and aimed for deeper understanding of these concepts in relation to study ability. Finally, weeks seven and eight assembled and further deepened the themes of the weeks by reflective exercises related to how to commit to value-based behaviour. In these last weeks of the course students were also given a task to write a 2–4 page-long learning report, in which they were asked to reflect on the meaning and effects of the course on their well-being and study ability, and to give anonymous and constructive peer feedback of two other reports. During the course students were also asked to answer surveys concerning different aspects of their well-being, and study ability at the beginning and at the end of the course and were given general feedback of the results. A further description of the course protocol can be found in an article by Asikainen and Katajavuori (2021).

The online course was organised two times: in autumn 2020 and spring 2021. Participants were recruited through convenience sampling via university study program leaders, teachers, university email lists, and social media. The course was available to students from all study programs and stages of study. Students were allowed to select their preferred course implementation. If student did not have a preference regarding the timing of the course implementation, they were randomly assigned to either the autumn or spring course. Furthermore, to enable small group work, the participants were randomly assigned to groups of 5-6 students. Informed consent was obtained from all participants in the online learning environment (Moodle). A total of 631 students signed up for the courses, of which 431 gave consent to participate in the study. Of the consent-given participants, 363 (84%) completed the course (90,6% female, mean age=27.50, SD= 7.61, median=25.11).

Table 1
Description of the course modules and content

	Theme	Assignments & feedback
Week 1	Introduction to the course	Time management task. Completing self-assessment measures. Results and feedback of the self-assessments.
Week 2	Values	Exercises related to acknowledging values.
Week 3	Mindfulness	Exercises related to recovery, mindful presence, and concentration. Individual assignments and online peer discussion.
Week 4	Cognitive defusion	Exercises related to identifying and differentiating thoughts. Individual assignments and online peer discussion.
Week 5	Study skills	Exercises related to organised study skills. Individual assignments and online peer discussion.
Week 6	Acceptance and self-compassion	Exercises related to facing and accepting difficult or unpleasant thoughts and differentiating self from thoughts. Individual assignments and online peer discussion.
Week 7	Committed action	Exercises related to committing to a value-based behaviour. Individual assignments and online peer discussion. Reflective learning report.
Week 8	Summary of the course	Completing self-assessment measures. Results and feedback of the self-assessments. Peer feedback of learning report.

4.2 Measures

Students responded to questionnaires at the beginning and the end of the intervention course. The dimensions of study-related burnout risk – exhaustion (e.g., 'I feel overwhelmed by studying') (EXH Cronbach's Alpha at the beginning of the course α_1 = .78, Cronbach's Alpha at the end of the course α_2 = .80), cynicism (e.g., 'I feel a lack of motivation in studying and often think of giving up') (CYN α_1= .87 , α_2 = .89), and inadequacy (e.g., 'I often have feelings of inadequacy when studying') (INAD α_1 = .70, α_2 =.68) – were measured on a scale of 1–6 (1=completely disagree, 6=completely agree) with the nine-item *Study Burnout Inventory* (SBI-9) (Salmela-Aro & Read, 2017).

Study engagement was measured on a scale of 1–6 (1=completely disagree, 6=completely agree) with the nine-item *Schoolwork Engagement Inventory* (EDA) consisting of three dimensions: energy (e.g., 'When I get up in the morning, I look forward to studying') (ENE α_1 = .82, α_2 =.85), dedication (e.g., 'I find studying full of meaning and purpose') (DED α_1 = .88, α_2 = .86), and absorption (e.g., 'Time flies when I am studying') (ABS α_1 = .81, α_2 = .82) (Salmela-Aro & Upadyaya, 2012).

The measurement of organised studying was done on a scale of 1–5 (1=completely disagree, 5=completely agree) with the questions of *HowULearn* (α_1 = .75, α_2 = .76) relating to organised studying (e.g., 'I organise my study time carefully to make the best use of it') (Parpala & Lindblom-Ylänne, 2012; modified from the ALSI, Entwistle et. al 2003).

Psychological flexibility was measured on a scale of 0–6 (0=strongly disagree, 6=strongly agree) with the 23-item *CompACT*, which includes three subscales: openness to experience (OE α_1 = .87, α_2 = .89) (e.g., 'I try to stay busy to keep thoughts or feelings from coming'), behavioural awareness (BA α_1 = .79, α_2 =.84) (e.g., 'I find it difficult to stay focused on what is happening in the present'), and valued action (VA α_1 = .87, α_2 = .89) (e.g., 'I can identify the things that really matter to me in life and pursue them') (Francis et al., 2016).

The measurement of well-being was done on a scale of 0–5 (0=never, 5=every day) with the 14-item *Mental Health Continuum – Short form* (MHC-SF), which has subscales of emotional well-

being (EWB α_1 = .83, α_2 = .83) (e.g., 'During the past month, how often did you feel satisfied with life?'), social well-being (SWB α_1 =.75, α_2 = .83) (e.g., 'During the past month, how often did you feel that you had something important to contribute to society?'), and psychological well-being (PWB α_1 = .78, α_2 = .83) (e.g., 'During the past month, how often did you feel that you had experiences that challenged you to grow and become a better person?') (Keyes, 2002).

4.3 Preliminary analysis

On eight students' responses to the questionnaires, there were multiple (>5) missing values for items concerning well-being and study burnout, and these participants were excluded from the data. Of the remaining 352 students, 14 had a maximum of one missing value per measure. Because no systematic pattern of missingness was detected, missing values were replaced with the individuals' means of the measures. Confirmatory factor analysis (CFA) models with maximum likelihood estimation with robust standard errors and a Satorra-Bentler-scaled test statistic (MLM) were completed as a preliminary analysis to verify the factor structure of the variables.

The fit of the CFA models was based on the Comparative Fit Index (CFI), which indicates a good fit with values above .95, root mean square error of approximation (RMSEA) that indexes a good fit with value below .06, and standardised root mean square residual (SRMR) that indexes a good fit with values below .08 (Hu & Bentler, 1999). The results of the CFA showed that the six-factor model of study burnout risk and engagement fit the data (χ^2 = 267.619 df = 120, p <.001, CFI = .96, RMSEA = .063 (90% C.I. [.053, .074]), SRMR = .047). A one-factor model of organised studying was also found to be good (χ^2 = 3.906, df = 6, p <.001, CFI = .994, RMSEA = .054 (90% C.I. [.000, .133]), SRMR = .020). The fit for three-dimensional model of well-being fit the data quite poorly (χ^2 = 265.838, df = 74, p <.001, CFI = .880, RMSEA = .094 (90% C.I. [.082, .106]), SRMR = .062). When examining the modification indices (MI) of the model, we discovered, that the sources of poor fit were related to the items concerning factor that represented social well-being. The covariance between social actualisation representing item 6. ("our society is a good place, or is becoming a better place, for all people") and social coherence representing item 8. ("the way our society works makes sense to you") had MI 44.64 with an expected parameter change (EPC) of 0.46. In addition, social contribution representing item 4. "You had something important to contribute to society" and social integration representing item 5. "You belonged to a community (like a social group, or your neighbourhood)" had MI 26.47 with an EPC of .45. Freeing the covariances between these similar variables (6. & 8., and 4. & 5.) resulted in acceptable fit (χ^2 = 215.059, df = 72, p <.001, CFI = .911, RMSEA = .082 (90% C.I. [.069, .094]), SRMR = 0.056). Because MHC-SF is a widely used measure of well-being and has demonstrated good psychometric properties across various age groups and nations (Iasiello et al., 2022; Lamers et al., 2011), and the internal consistency of the variables were good, we decided to use the measure, although the model did not fit the data in an ideal way.

The results of CFA concerning three-dimensional model of psychological flexibility of the measure CompACT indicated also in poor fit (χ^2 = 692.868, df = 227, p <.001, CFI = .845, RMSEA = .083 (90% C.I. [.076, .090]), SRMR = .081). When examining the modification indices (MI) to identify potential areas for improving model fit, we identified pairs of items with high modification indices that had highly similar content. The covariance between item 10. ("I behave in line with my personal values") and item 21. ("My values are really reflected in my behavior") representing dimension valued action (VA) had MI 67.57 with an expected parameter change (EPC) of 0.34. In addition, item 13. ("I am willing to fully experience whatever thoughts, feelings and sensations come up for me, without trying to change or defend against them") and item 22. ("I can take thoughts and feelings as they come, without attempting to control or avoid them") of the dimension openness to experiences (OE) had MI 68.45 with an EPC of 0.76. Freeing the covariances of these highly similar variables resulted in acceptable fit (χ^2 = 673.967, df = 225, p <.001, CFI = 0.883, RMSEA = 0.072 (90% C.I. [0.065, 0.079]), SRMR = 0.078). As this adjustment of the three-factor structure of the items of CompACT had an

acceptable fit in the data, and the internal consistency of the variables were good, we decided to use the measure.

The person-oriented analysis of study-related burnout risk and engagement was conducted using latent profile analysis (LPA). LPA classifies individuals, rather than variables, into homogeneous subpopulations based on underlying classes (Collins & Lanza, 2009) and gives an opportunity to study intra-individual differences between latent groups of students (Hickendorff et al., 2018). LPA was conducted with tidyLPA (Rosenberg, 2018) on the standardised means of study-related burnout (EXH, CYN, INAD) and engagement (ENE, DED, ABS) at the beginning of the intervention course. Five fit indices that enable comparison between different models and decision making regarding the number of underlying profiles were used to compare the profile solutions: the Akaike Information Criterion (AIC; Akaike, 1987), Bayesian information criterion (BIC; Schwarz, 1978), SABIC (sample-size-adjusted BIC; Sclove, 1987), bootstrap likelihood ratio test (BLRT; McLachlan,1987), and entropy measure of classification uncertainty (Celeux & Soromenho, 1996). The solution that best fit the data in accordance with these indicators – and that was also considered reasonable in terms of number of persons in the profiles – and previous research of study-related burnout and engagement was chosen as the final latent profile model. The effect of Time, Group, and Time × Group interaction effects were explored by mixed design ANOVA with repeated measures, with profile as the between factor, and Bonferroni adjustment for multiple comparisons with alpha level of .05. Partial Eta Squared (η^2_p) was used as the effect size. To compare the differences in changes between the profiles, between measurements (1-2) change indicating variable was formed, and the post-hoc comparisons were analysed using Dunnett's T3 test. The data analysis was undertaken by RStudio (version 2023.03.0+386 'Cherry Blossom') and SPSS (version 29).

Table 2
Descriptive statistics

N	352			
Age mean (SD)	27.55 (7.72)			
Age median	25.11			
Female N (%)	318 (90.3%)			
Male N (%)	33 (9.4%)			
	Mean 1 (SD)	**α_1**	**Mean 2 (SD)**	**α_2**
Study burnout risk (SBI-9)				
Exhaustion (EXH)	3.51 (1.10)	.78	3.14 (1.13)	.80
Cynicism (CYN)	2.79 (1.37)	.87	2.49 (1.32)	.89
Inadequacy (INAD)	4.20 (1.30)	.70	3.77 (1.34)	.68
Study engagement (EDA)				
Energy (ENE)	3.48 (1.00)	.82	3.64 (1.09)	.85
Dedication (DED)	4.39 (1.01)	.88	4.49 (1.02)	.86
Absorption (ABS)	3.48 (1.05)	.81	3.70 (1.07)	.82
HowULearn				
Organised studying (ORG)	3.08 (.92)	.75	3.42 (87)	.76
Well-being (MHC-SF)				
Emotional well-being (EWB)	3.55 (.92)	.83	3.73 (.91)	.83
Social well-being (SWB)	2.70 (.99)	.75	2.99 (1.05)	.83
Psychological well-being (PWB)	3.34 (.88)	.78	3.64 (.89)	.83
Psychological flexibility (CompACT)				
Openness to experiences (OE)	3.20 (1.23)	.87	3.76 (1.21)	.89
Behavioural awareness (BA)	3.31 (1.22)	.79	3.59 (1.26)	.84
Valued action (VA)	4.16 (.95)	.87	4.53 (.86)	.89

Note. Mean 1 = Mean at the beginning of the course, Mean 2 = Mean at the end of the course, SD = Standard deviation, α_1 = Cronbach's Alpha of the measure at the first measurement time, α_2 = Cronbach's Alpha of the measure at the end of the course.

5 Results

5.1 The profile solution

The first aim of the study was to examine students' study-related burnout and engagement profiles to find out if there are differences in the changes between the profiles. The different fit indexes of the LPA favoured solutions with six profiles (AIC = 4921.90, BIC = 5103.50, entropy = .85) (see Table 3.). Considering the previous findings, the theory of study burnout and engagement (Tuominen-Soini & Salmela-Aro, 2014; Salmela-Aro & Read, 2017), and the number of students in the profiles, the four-profile solution (AIC = 5065.73, BIC =5193.23, entropy = .83) was chosen to represent the best fit.

The four profiles were named: 1. *indifferent*, 2. *engaged*, 3. *engaged-inefficacious*, and 4. *burned-out* (see Figure 1). In the *indifferent* profile (n=133, 37.8%), the beginning mean of cynicism was slightly higher, and means of energy, dedication, absorptions slightly lower than the average of all students. In this profile, organised studying, and the dimensions of well-being, and psychological

flexibility were also close to average (see Table 4). In the *engaged* profile (n=102, 29%), students' energy, dedication, and absorption were higher, and exhaustion, cynicism, and inadequacy lower than the average of all students. In this profile, the beginning means of well-being, psychological flexibility, and organised studying were the highest (See Table 4). The *engaged-inefficacious* profile (n=48, 13.6%) represented students with slightly below average cynicism and high means of energy, dedication, absorption, exhaustion, and inadequacy. The beginning means of well-being, organised studying, and psychological flexibility were close to the average of all students, except for behavioural awareness, which had a slightly lower beginning mean than the average of the whole sample of students. In the *burned-out* profile (n=69, 19.6%), students had high means of exhaustion, cynicism, and inadequacy and low means of energy, dedication, and absorption. In this profile, the means of well-being, psychological flexibility, and organised study skills were the lowest of the profiles.

Table 3
Fit statistics for the profile solutions

Profile n	AIC	BIC	SABIC	Entropy	BLRT	BLRT p	Prob. min-max	Group sizes
1	6011.59	6057.95	6019.88	1	-	-	1	352
2	5331.99	5405.40	5345.13	.87	693.60	.010	.95-.97	195, 157
3	5136.01	5236.47	5153.98	.83	209.98	.010	.91-.94	151, 128, 73
4	**5065.73**	**5193.23**	**5088.54**	**.83**	**84.29**	.010	**.83-.94**	**133, 102, 48, 69**
5	5002.73	5157.27	5030.38	.81	76.99	.010	.77-.94	85, 88, 75, 44, 60
6	4921.90	5103.50	4954.39	.85	94.83	.010	.84-.94	85, 88, 73, 7, 26,73

Note. AIC = Akaike information criterion; BIC = Bayesian information criterion; SABIC = Sample-size-adjusted BIC; Entropy = A measure of classification uncertainty; BLRT: bootstrapped likelihood test; BLRT-p: p-value for the bootstrapped likelihood ratio test; Prob. min-max = Minimum and maximum of the diagonal of the average latent class probabilities for most likely class memberships, by assigned class.

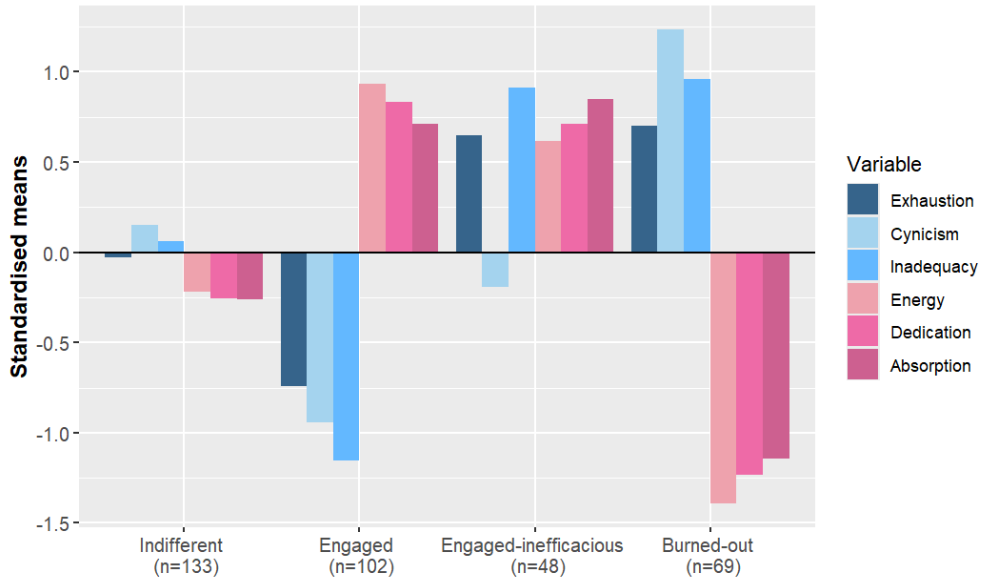

Figure 1. Standardised means of the dimensions of study burnout and engagement at the beginning of the course intervention in the four-profile solution

Table 4
Means and standard deviations of the profiles at the beginning and at the end of the course

	Indifferent (n=133)		Engaged (n=102)		Engaged-inefficacious (n=48)		Burned-out (n=69)	
	M1 (SD)	M2 (SD)	M1 (SD)	M2 (SD)	M1 (SD)	M2 (SD)	M1 (SD)	M2 (SD)
EXH	3.49 (.94)	3.16 (.96)	2.70 (.81)	2.44 (.84)	4.23 (.83)	3.81 (1.10)	4.28 (1.05)	3.68 (1.23)
CYN	3.00 (1.01)	2.66 (1.08)	1.50 (.54)	1.42 (.59)	2.53 (1.26)	2.41 (1.29)	4.49 (.83)	3.78 (1.27)
INAD	4.27 (.79)	3.87 (1.04)	2.69 (.80)	2.56 (1.04)	5.39 (.59)	4.51 (1.00)	5.45 (.60)	4.86 (1.02)
ENE	3.27 (.53)	3.44 (.79)	4.42 (.54)	4.45 (.80)	4.10 (.51)	4.08 (.96)	2.09 (.62)	2.52 (.91)
DED	4.13 (.62)	4.24 (.84)	5.23 (.55)	5.24 (.66)	5.10 (.56)	4.92 (.79)	3.14 (.84)	3.55 (.94)
ABS	3.21 (.61)	3.54 (.82)	4.23 (.74)	4.32 (.87)	4.37 (.82)	4.31 (.84)	2.29 (.81)	2.68 (1.00)
ORG	2.99 (.83)	3.34 (.78)	3.69 (.73)	3.94 (.65)	3.02 (.78)	3.46 (.79)	2.37 (.86)	2.80 (.91)
EWB	3.51 (.81)	3.67 (.80)	4.05 (.65)	4.25 (.54)	3.65 (.88)	3.74 (.76)	2.81 (.99)	3.07 (1.16)
SWB	2.66 (.90)	2.85 (.93)	3.19 (.88)	3.60 (.81)	2.66 (.98)	3.00 (.99)	2.09 (.97)	2.34 (1.17)
PWB	3.27 (.76)	3.54 (.78)	3.88 (.68)	4.17 (.55)	3.34 (.94)	3.67 (.84)	2.69 (.85)	3.05 (1.06)
OE	3.08 (1.08)	3.60 (1.04)	3.92 (1.13)	4.53 (.95)	3.19 (1.24)	3.65 (1.26)	2.38 (1.02)	3.00 (1.23)
BA	3.24 (1.17)	3.48 (1.26)	3.83 (1.11)	4.26 (1.06)	2.99 (1.34)	3.40 (1.18)	2.88 (1.12)	2.94 (1.15)
VA	4.05 (.82)	4.43 (.75)	4.79 (.63)	5.07 (.56)	4.10 (.97)	4.46 (.90)	3.48 (1.00)	3.99 (.97)

Note. EXH = Exhaustion, CYN = Cynicism, INAD = Inadequacy, ENE = Energy, DED = Dedication, ABS = Absorption, ORG = Organised studying, EWB = Emotional well-being, SWB = Social well-being, PWB = Psychological well-being, OE = Openness to experience, BA = Behavioural awareness, VA = Valued action, M1 = Mean at the beginning of the course, M2 = Mean at the end of the course, SD = Standard deviation.

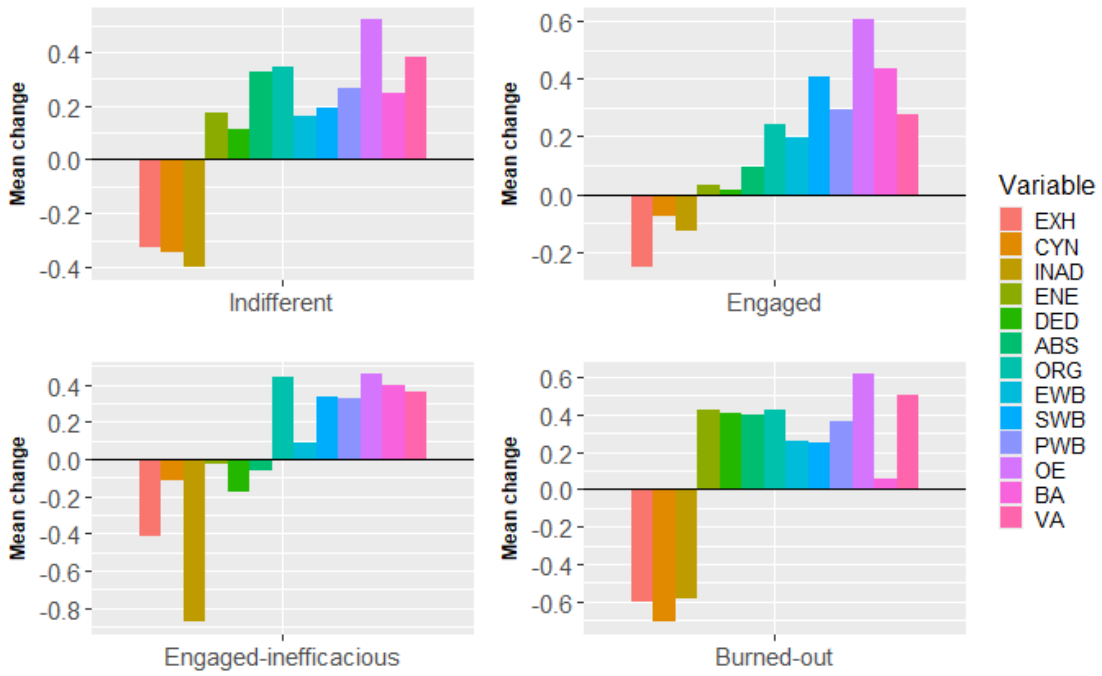

Figure 2. Mean changes in the profiles between the first and second measurement time

Note. EXH = Exhaustion, CYN = Cynicism, INAD = Inadequacy, ENE = Energy, DED = Dedication, ABS = Absorption, ORG = Organised studying, EWB = Emotional well-being, SWB = Social well-being, PWB = Psychological well-being, OE = Openness to experience, BA = Behavioural awareness, VA = Valued action.

5.2 Changes within and between the profiles

The second aim of this study was to explore the differences in the changes between the beginning and end measurements between and within the profiles. When studying the changes at the end of the intervention course, the results of mixed ANOVA with repeated measures indicated, that the main effect of time was significant on all observed variables: study burnout decreased, and engagement, organised studying, well-being, and psychological flexibility increased statistically significantly in the whole sample of students (See Table 5). The largest effect size was found in the increase of openness to experiences (η^2_p=.28). No statistically significant Time x Group effects were to be seen in the changes of exhaustion, organised studying, dimensions of well-being or psychological flexibility The profiles did differ statistically significantly in the changes of cynicism (F(3, 348) = 8.08, p <.001), inadequacy (F(3, 348) = 7.86, p <.001), energy (F(3, 348) = 4.48, p = .004), absorption (F(3, 348) = 5.40, p <.001) and dedication (F(3, 348) = 6.52, p <.001). The largest effect size of the interaction of profile and time was found in changes of cynicism (η^2_p=.07).

The post-hoc test indicated that the change in cynicism was statistically significantly different between *indifferent* and *engaged* (p=.028), *engaged* and *burned-out* (p <.001), and *engaged-inefficacious* and *burned-out* (p=.019) profiles. The pairwise comparisons of the first and second measurement within the profiles showed, that cynicism decreased statistically significantly in the *indifferent* (F(1, 348) = 20.72, p <.001, η^2_p=.06) and *burned-out* profiles (F(1, 348) = 45.31, p <.001, η^2_p=.12). Cynicism decreased slightly also in *engaged* and *engaged-inefficacious* profiles, but the changes were not statistically significant. According to post-hoc test, changes in inadequacy differed statistically significantly between the profiles *indifferent* and *engaged-inefficacious* (p=.014), *engaged*

and *engaged-inefficacious* (p <.001), and *engaged* and *burned-out* (p=.008). The pairwise comparisons of the first and second measurement within the profiles showed, that inadequacy decreased statistically significantly in the *indifferent* (F(1, 348) = 24.61, p <.001, η^2_p=.07), *engaged-inefficacious* (F(1, 348) = 42.03, p <.001, η^2_p=.11), and *burned-out* profiles (F(1, 348) =27.19, p <.001, η^2_p=.07). The decrease in inadequacy was not statistically significant in the *engaged* profile, and was greater in the *engaged-inefficacious* profile, than in the *indifferent* profile.

Changes in energy differed statistically significantly between the profiles *engaged* and *burned-out* (p=.012) and *engaged-inefficacious* and *burned-out* (p=.019). The pairwise comparisons of the first and second measurement within the profiles showed, that energy increased statistically significantly in the *indifferent* (F(1, 348) = 6.64, p=.010, η^2_p=.02) and *burned-out* (F(1, 348) = 20.24, p <.001, η^2_p=.06) profiles. Energy stayed the same in the *engaged*, and decreased in the *engaged-inefficacious* profile, but the changes were not statistically significant. Changes in dedication differed statistically significantly between the profiles *engaged* and *burned-out* (p=.015) and *engaged-inefficacious* and *burned-out* (p <.001). The pairwise comparisons of the first and second measurement within the profiles showed, that dedication increased statistically significantly in the *burned-out* profile (F(1, 348) = 20.13, p<.001, η^2_p=.06). Dedication increased marginally in the indifferent and engaged profile, and decreased in the engaged-inefficacious profile, but the changes were not statistically significant. According to post-hoc test, changes in absorption differed statistically significantly between the profiles *engaged-inefficacious* and *indifferent* (p=.023), and *burned-out* and *engaged-inefficacious* (p=.014). The pairwise comparisons of the first and second measurement within the profiles showed, that absorption increased statistically significantly in *indifferent* (F(1, 348) = 25.25, p <.001, η^2_p=.07) and *burned-out* (F(1, 348) = 19.36, p <.001, η^2_p=.05) profiles. There was a marginal and statistically insignificant increase in absorption in the *engaged* and decrease in *engaged-inefficacious* profile. Please see Figure 2 for a visualisation of the mean changes within profiles.

Table 5
Mixed ANOVA with repeated measures and the post-hoc comparisons of the mean changes between the profiles

	Between subjects					Within-subjects effects								
	Group					Time				Time x Group				
	df	*F*	*p*	η^2_p	Error	df	*F*	*p*	η^2_p	df	*F*	*p*	η^2_p	Error (time)	Post-hoc comparisons [a]
EXH	3	50.79	<.001	.30	348	1	60.67	<.001	.15	3	2.24	.083	.02	348	
CYN	3	131.97	<.001	.53	348	1	38.59	<.001	.10	3	8.08	<.001	.07	348	1≠2*; 2≠4***; 3≠4*
INAD	3	187.42	<.001	.62	348	1	86.16	<.001	.20	3	7.86	<.001	.06	348	1≠3*; 2≠3***; 2≠4**
ENE	3	196.46	<.001	.63	348	1	11.30	<.001	.03	3	4.48	.004	.04	348	4≠2,3***
DED	3	145.48	<.001	.56	348	1	4.21	.041	.01	3	6.52	<.001	.05	348	2≠4*; 3≠4***
ABS	3	109.50	<.001	.49	348	1	19.32	<.001	.05	3	5.40	.001	.04	348	1≠3*; 3≠4*
ORG	3	42.94	<.001	.27	348	1	79.43	<.001	.19	3	1.27	.285	.01	348	
EWB	3	35.44	<.001	.23	348	1	24.72	<.001	.07	3	.78	.507	.01	348	
SWB	3	26.57	<.001	.19	348	1	48.85	<.001	.12	3	1.75	.157	.02	348	
PWB	3	37.34	<.001	.24	348	1	64.54	<.001	.16	3	.32	.812	.01	348	
OE	3	34.17	<.001	.22	348	1	114.39	<.001	.28	3	.48	.698	.00	348	
BA	3	18.93	<.001	.14	348	1	20.53	<.001	.06	3	1.90	.129	.02	348	
VA	3	41.91	<.001	.27	348	1	73.80	<.001	.18	3	1.20	.310	.01	348	

Note. EXH = Exhaustion, CYN = Cynicism, INAD = Inadequacy, ENE = Energy, DED = Dedication, ABS = Absorption, ORG = Organised studying, EWB = Emotional well-being, SWB = Social well-being, PWB = Psychological well-being, OE = Openness to experience, BA = Behavioural awareness, VA = Valued action, η^2_p = Partial eta squared. Group = Profile, [a] Dunnett T3 post-hoc comparisons of mean changes between the profiles, Profile 1 = Indifferent, 2 = Engaged, 3 = Engaged-inefficacious, 4 = Burned-out, Significance level *p < .05, **p < .01, ***p < .001

6. Discussion

The aim of this study was to compare the effects of a study-integrated ACT-based course intervention on different aspects of university students' well-being and study ability in latent groups of students that had different levels of study burnout and engagement at the beginning of the course. As we applied a person-oriented approach to explore the different dimensions of students' study burnout and engagement at the beginning of the course, four profiles were found: *indifferent*, *engaged*, *engaged-inefficacious*, and *burned-out*. When studying the changes at the end of the course, the results of mixed ANOVA with repeated measures indicated, that the main effect of time was significant on all observed variables: Over the entire course, students' burnout risk decreased significantly, while their engagement, organised studying, well-being, and psychological flexibility increased significantly. When examining the changes across different profiles, it was found that the changes in exhaustion, psychological flexibility, well-being, and organised studying were similar across all profiles. However, differences were observed between the profiles in terms of changes in cynicism, feelings of inadequacy, and engagement (including energy, dedication, and absorption).

The found four profiles were in line with earlier findings of university students' engagement and burnout profiles (Salmela-Aro & Reid, 2017). The effects of course level changes were also in line with results of previous studies, that have showed that ACT-based interventions can reduce students' burnout risk and increase study engagement, organised studying, psychological flexibility, and well-being (Frögéli et al., 2016; Grégoire et al., 2018; Howell & Passmore, 2019; Katajavuori et al., 2021; Räihä et al., 2024). Since no previous research has applied a person-oriented approach to ACT-based interventions with students, this study provides new knowledge about the varying effects of these interventions on students' representing different profiles of burnout and engagement. Considering the differences in the changes of study burnout and engagement, the *burned-out* profile had the most to gain in the beginning of the course and benefitted the most according to the decrease of cynicism. Respectively, in the *engaged* profile, the means of the dimensions of burnout were below and engagement above the average already at the beginning of the course. In the *engaged* profile study engagement stayed close the same at the end of the course, but there was a significant reduction in the exhaustion also in this profile. In the *indifferent* profile students' study engagement increased and burnout risk decreased, largest decrease being in the mean of inadequacy. An interesting combination of features was to be seen in the *engaged-inefficacious* profile, which represented students that were both engaged and strained from studies. In this profile, the mean of inadequacy decreased the most, alongside decrease in exhaustion. Furthermore, there was a small decrease in the dimensions of study engagement. Although the decreases in engagement were not statistically significant, the finding is interesting, as *engaged-inefficacious* was the only profile in which engagement decreased. The reduction in engagement together with significant increase in the dimensions of well-being, psychological flexibility, and organised studying in the *engaged-inefficacious* profile could reflect the previous notions that study engagement has also its 'dark side' (Salmela-Aro et al., 2016; Salmela-Aro & Reid, 2017). These changes may also suggest that, as a result of increased psychological flexibility, students in this profile have become more aware of their values and behavior, enabling them to better utilise personally relevant resources that help alleviate the strain of studying.

As this study was done in autumn 2020 and spring 2021 during the COVID-19 pandemic, distance learning and social distancing as contextual features might have added the discrepancy of students' recourses and demands on some of the students. In a 2021 study of the Finnish Institute for Health and Welfare, 70% of students in higher education reported that the challenges with their studying had increased during the pandemic, and almost half of the students had experienced an increase in the workload required for their studies (Parikka et al., 2021). However, academic workload has also been shown to be positively related not only to burnout risk but also to study engagement (Olson et al., 2023), and not all students' experienced strain from distance learning, as some students reported that studying became easier during the pandemic (Asikainen & Katajavuori, 2023; Parikka et al., 2021). These differences can be related to different contextual factors such as social support (Tindle et al., 2022), but also to different competencies to regulate study-related activities (Parpala et al., 2021), and the level of

students' psychological flexibility (Asikainen & Katajavuori, 2023). The findings of this present study that organised studying, psychological flexibility, and different aspects of well-being increased alongside decrease in exhaustion in all burnout and engagement profiles indicate effectiveness of ACT-based course to enhance different kind of students' study abilities alongside well-being.

6.1 Implications for practice

The findings of this study show promise of study-integrated ACT-based courses as an effective way to support students' well-being and personal resources, such as psychological flexibility and organised studying. The opportunity to enhance psychological flexibility together with study-related skills can help students, for example, to balance the strain from the demands of studying, and to make use of available resources by reducing avoidant behaviour (Tindle et al., 2022). As there are also previous findings that ACT-based online interventions can reduce students' distress (Levin et al., 2017; Räsänen et al., 2016), a course that combines practicing skills of psychological flexibility and organised studying can be beneficial for a variety of participants – both for students that report elevated levels of study burnout risk and for the ones who are doing well – to prevent future distress. The importance of the findings of this study, that showed increases in students' emotional, psychological, and social well-being in all the profiles are further emphasised, with the notion that higher levels of well-being can also work as mental illbeing preventing factor (Keyes, 2002). Therefore, aiming to promote students' well-being related factors alongside targeting the well-being depleting aspects such as study burnout is highly important. This also indicates that providing this kind of course intervention as early as possible in the studies could be important from the point of view of preventing future challenges.

6.2 Limitations and future directions

Although the results of this study provide new knowledge of the effectiveness of ACT-based interventions for different burnout and engagement profiles representing university students, several limitations should be mentioned. First, the study sample was quite homogeneous, as the participants of the intervention course were mainly young females. To enhance generalisability, future research should aim to investigate the effects of the course using randomised and representative samples. Second, as the data was collected during COVID-19 pandemic, this could have influenced the results of the study in several ways. Higher education students overall mental well-being has been found to be lower during the COVID-19 pandemic, than before the outbreak (Sarasjärvi et al., 2022), alongside higher levels of study burnout risk, and lower levels of engagement (Salmela-Aro et al., 2022b). Additionally, given the nature of the course, it is reasonable to assume that students experiencing study-related burden were particularly inclined to enrol. However, as 84% of the consent-given participants completed the course, the dropout rate (16%) was not higher than the mean dropout rates in ACT-interventions (15,8%) (Ong et al., 2018). The online delivery of the course made it possible to offer the course to all willing students, alongside providing peer-support and opportunities to connect with other students' during social distancing in the form of online group discussions. As lack of interaction and emotional support has been shown to be associated with university students' negative mental health trajectories (Elmer et al., 2020), and to mediate the relation between burnout and psychological well-being (Rehman et al., 2020), further studies should deepen the knowledge related to the quality of the peer groups in relation to the effects of the course.

Third, as the fit of the multidimensional measures of psychological flexibility and well-being were found relatively poor in this sample, the results concerning the changes in different dimensions of these measures should be interpreted with caution. A poor fit of the 23-item CompACT used in this study has been reported also in other studies (Hsu et al., 2023; Tynan et al., 2022; Trindade et al., 2022), and resulted in validation of shorter 18-, 15-, and 10-item versions of the measure. Therefore, a validation of a shorted version of CompACT in a representative Finnish sample would be advisable. In this data, the poor fit of the widely used measure of well-being MHC-SF was found to be related

especially to the items that represented social well-being. As social well-being refers to "the appraisal of one's circumstance and functioning in society" (Keyes, 1998), students' evaluations of social actualisation, coherence, contribution, and integration could have been affected by the different contextual factors related to COVID-19 pandemic, such as uncertainty, social distancing and distance learning that occurred during the times of the measurements. Furthermore, the significance of this study's findings, which demonstrated a significant increase in students' openness to experiences across all profiles, is emphasised by the recognition that openness to experiences, along with the desire and effort to grow, are fundamental components of social actualization (Keyes, 1998). This also underscores the need for further research regarding longitudinal trajectories of social well-being among course participating students.

Fourth limitation, that should be mentioned is the sample size of the data. For example, in their review of LPA applying studies, Spurk and others (2020) conclude, that based on past research a sample size around 500 seems reasonable to detect a correct number of latent profiles. However, in a simulation study of Tein and others (2013) it was found that a sample size of 1000 did not show higher statistical power than the conditions with sample size of 250 or 500. Nevertheless, as the size of some of the identified profiles can be insufficient for additional analyses, further person-oriented studies of ACT-based interventions should aim for larger sample sizes. The fifth limitation that should be mentioned is that, even though by applying person-oriented approaches it is possible to reach underlying phenomena of different subgroups of students (Bergman & Lundh, 2015), the research of changes in these subgroups does not reach the variety of individual changes, or lack of changes, which occure during the course. The results of this study also indicated differences in the changes of study engagement and burnout risk between the profiles. Even though these differences were related to the changes in the *engaged* profile with low levels of burnout risk and high levels of engagement, which stayed the same at the end of the intervention course, the changes in the *engaged-inefficacious* profile give an indication of the importance of identifying students' different needs at the beginning, and during of the intervention. Further studies should apply qualitative data to deepen the knowledge of different outcomes and related factors. Furthermore, as these changes are bind not only to students' individual needs but also the context, further intra- and inter-individual process-based research is important (Hayes et al., 2022). As changes in psychological flexibility and well-being can take time (Kinnunen et al., 2019), there is also a need to study different longitudinal trajectories of the changes. As it has been shown that continuity of practice is related to higher benefits with different burnout profiles representing ACT-based intervention participants (Kinnunen et al., 2019), further research of factors related to learning and intensity of practicing could also deepen the knowledge of the relationship of changes in students' behaviour, and well-being during and after the course.

7. Conclusions

The results of this study support the notion that study burnout and engagement, as multidimensional constructs, are not simply opposite ends of a continuum but rather distinct phenomena that can vary in emphasis across different dimensions. The results also indicated that a study-integrated ACT-based online course can be effective in reducing exhaustion, and enhancing different dimensions of psychological flexibility, well-being, and organised studying of different study burnout and engagement representing latent groups of university students. Based on these beneficial effects regardless of the initial burnout risk, it can be concluded, that applying and further developing ACT-based course interventions more widely as part of university studies could be an effective way to support student well-being – even before there are problems. Further research is needed on the long-term effects of the intervention course on students' well-being and on the individual and qualitative differences in students' behaviour changes and learning during the intervention course.

Ethical Approval

The research has been conducted in accordance with the Declaration of Helsinki guidelines and followed Finnish National Board on Research Integrity's ethical principles for research with human participants. Informed consent was obtained from all individual participants included in the study.

Key points

- University students participated in a study-integrated Acceptance and Commitment (ACT) -based intervention course.
- Students (N=352) represented four different study burnout and engagement profiles at the beginning of the course.
- Well-being, psychological flexibility, and organised studying increased, while exhaustion decreased across all profiles.
- The profiles differed in the changes observed in cynicism, inadequacy, and engagement.
- ACT-based courses can be an effective way to enhance university students' well-being and study ability, regardless of their initial burnout level.

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