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How Mindfulness Translates into Engagement and Flourishing: The Role of Flow

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Mindfulness and flow are optimal experiences of consciousness that are positively related to each other and both are associated with enhanced well-being. The current study expanded upon previous work by investigating the hypothesis that flow experienced specifically in academic activities mediates the relationship between dispositional mindfulness and academic engagement and academic flourishing. A sample of 270 university students in Croatia (77% female) completed an online survey that included The Mindful Attention Awareness Scale, The Swedish Flow Proneness Questionnaire for Academic Domain, The Academic Engagement Scale, and The Academic Flourishing Scale. Mindfulness was positively related to academic flow, while both mindfulness and academic flow were associated with higher behavioural and cognitive academic engagement and academic flourishing, and negatively related to anxious engagement. The results of mediation analyses revealed that academic flow is the underlying mechanism for translating the effects of dispositional mindfulness into higher behavioural and cognitive academic engagement, lower anxious engagement and higher academic flourishing. The results are in line with the flow theory and support the role of dispositional mindfulness in engagement in the classroom and flourishing in studying.

Keywords: academic flourishing; engagement; flow; mindfulness; well-being.

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Introduction

Mindfulness and flow are concepts in positive psychology that are both associated with well-being, including flourishing (e.g., Brown & Ryan, 2003; Olčar et al., 2021). However, there is a lack of studies investigating

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the role of mindfulness and the flow which students experience in academic activities, in students' classroom engagement and flourishing in studying. This research aims to fill this gap in the literature by investigating the relationships between dispositional mindfulness, flow experienced in academic activities, students' academic engagement (behavioural, cognitive and emotional) and academic flourishing. It also aims to deepen our understanding of the mechanisms by which mindfulness may facilitate students' academic engagement and academic flourishing, and to our knowledge, it is the first study in which academic flow is proposed as a mediator in these relationships.

The present study expands the literature on mindfulness flow, engagement and flourishing in important ways. First, the study expands the knowledge about the mindfulness-flow relationship by investigating specifically flow experienced in academic activities. Second, the study investigates the relationship between mindfulness and three dimensions of engagement in the classroom. The most important novelty of the study is that it contributes uniquely to the literature by testing flow in academic activities as a mediator that may aid in the understanding of these associations.

Mindfulness

Mindfulness can be described as a psychological process that involves self-regulation of attention and orientation to what is happening in the present with non-judgement and non-reactivity to inner experience (Bishop et al., 2004). The first component of mindfulness is the self-regulation of attention, referring to one's ability to manipulate one's attentional processes, including the ability to elicit present-moment awareness and to sustain focused attention over time. The second component is an orientation to one's experience while at the same time accepting one's thoughts, feelings, and emotions in a non-judgemental way (Bishop et al., 2004; Brown & Ryan, 2003).

Mindfulness could be operationalised both as a state or as a trait. Mindfulness as a state represents a short-term experience that can be evoked through purposeful self-regulation of attention to the present moment (Bishop et al., 2004). Trait or dispositional mindfulness reflects inherent dispositional tendencies toward higher frequencies of the mindful states (Brown & Ryan, 2003). Training in experiencing mindfulness states may lead to a more prominent trait mindfulness (Kiken et al., 2015).

In academic settings mindfulness has been associated with students' achievement-related self-regulation and lower procrastination (Howell & Buro, 2011), higher academic self-efficiency (Hanley et al., 2015), engagement (e.g., Elphinstone et al., 2019), and better academic performance (Elphinstone et al., 2019; Gajšek et al., 2023; Miralles-Armenteros et al., 2021). Furthermore, mindfulness has been positively associated with first-year students' academic, social, and emotional adjustment to university (Mettler et al., 2019), as well as students' subjective well-being (Akin & Akin, 2015; Brown & Ryan, 2003). In line with this, an increase in mindfulness via mindfulness programmes was associated with reduced stress, anxiety, and depression amongst university students (Lynch et al., 2018).

Mindfulness and flow

The experience of flow may be defined as "the state in which people are so involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that people will do it even at great cost, for the sheer sake of doing it" (Csikszentmihalyi, 1990, p. 4). Flow experience can occur in a variety of activities, from dancing to solving mathematical problems, and was found to be associated with peak performance and increased well-being in various areas (Csikszentmihalyi, 1990). Flow could also be operationalised as a trait capturing a stable disposition to experience flow more frequently (Csikszentmihalyi, 1990), i.e., flow proneness (Ullén et al., 2012).

In education, experiencing flow in academic activities such as learning for exams, preparing study projects, and doing assignments (also referred to as academic flow) was found to be experienced less often than flow in leisure and routine activities (Olčar et al., 2021), but is positively associated with students' academic self-efficacy (Mesurado et al., 2016), engagement (Ljubin-Golub et al., 2018; Mesurado et al., 2016) and academic achievement (Olčar et al., 2021). Moreover, experiencing academic flow increased positive affect and decreased negative affect (Rogatko, 2009), increased flourishing and life satisfaction (Olčar et al., 2021; Rijavec et al., 2021), and decreased burnout (Rijavec & Ljubin-Golub, 2019).

A theoretical link between flow and mindfulness may be found in attentional processes. Nakamura and Csikszentmihalyi (2005) suggested that attentional control is one of the key components for entering and staying in the flow. Namely, a precondition to experience flow is to be able to give full attention to the task at hand, whereby, to stay in the flow, one has to be able to maintain attention to the task. In other words, the ability to focus attention on an activity is central to experiencing flow, and thus enhanced attention control may be beneficial or even crucial for flow experiences to occur. In line with this, studies found a positive association between sustained attention abilities and flow experiences (Cermakova et al., 2010; Marty-Dugas et al., 2021). As already mentioned, mindfulness incorporates attentional control, i.e., sustained attention (Bishop et al., 2004), which is essential for experiencing flow.

A meta-analysis of empirical studies confirmed the positive relationship between mindfulness and flow (r=0.38) with mindfulness being more strongly associated with trait flow than with state flow (Schutte & Malouff, 2023). Moreover, some evidence for the causal role of mindfulness in the mindfulness-flow relationship was found in both recent experimental (Marty-Dugas et al., 2023) and intervention studies (e.g., Chen et al., 2019; Scott-Hamilton et al., 2016) in athletes intended to increase mindfulness, showing that mindfulness interventions may increase state flow experience.

To date, however, research tends to focus on the relationship between mindfulness and flow experienced in sports or non-specified activities. Only few studies have focused on flow experienced in school-related, i.e., academic activities (e.g., Faria, 2016; Gajšek et al., 2023; Ljubin-Golub & Gajšek, 2022). Since both mindfulness and academic flow are valuable resources for academic success and flourishing (Akin & Akin, 2015; Olčar et al., 2021), it is important to study their relationship in the context of higher education especially due to the lack of research on mindfulness in this context.

Mindfulness, academic flow, and academic engagement

Academic engagement is a multidimensional concept, and it has been conceptualised in different ways in educational settings. A prevailing conceptualisation suggests that academic engagement consists of three dimensions (for review, see Fredricks et al., 2004), i.e., behavioural, cognitive, and emotional engagement. Behavioural engagement refers to involvement in academic, social, extracurricular activities, or any other type of activity necessary for achieving good academic results and avoiding dropping out. Cognitive engagement refers to the amount of attention and strategic self-regulation spent to master difficult cognitive tasks and attain academic knowledge and competencies; whilst emotional engagement refers to positive and negative emotional reactions to academic activities, teachers, colleagues, and institutions (Fredricks et al., 2004). It should be noted that negative emotional engagement differs from academic anxiety or anxiety related to study and tests.

Two recent studies (Elphinstone et al., 2019; Miralles-Armenteros et al., 2021) suggested that mindfulness led to higher academic engagement, but using Schaufeli et al. (2002) conceptualisation of academic engagement as a positive and affective-cognitive state of psychological well-being characterised by vigour, dedication, and absorption. Elphinstone et al. (2019) found an indirect effect of mindfulness on higher engagement via increased adaptability and nonattachment, while Miralles-Armenteros et al. (2021) found that mindfulness exerts an effect on engagement both directly and indirectly through compassion. These studies have suggested several mechanisms through which mindfulness may affect academic engagement.

However, there is a lack of research on the relationship between mindfulness and academic engagement as conceptualised in three dimensions, i.e., behavioural, cognitive and emotional, although both theoretical and empirical literature suggests that mindfulness may be positively related to behavioural and cognitive engagement and negatively to anxious engagement. More mindful students are theoretically prone to have better self-regulation of attention and to be oriented to the present experience (Bishop et al., 2004) and to have lower academic procrastination and to be more engaged in academic help-seeking when faced with difficulties on a task (Howell & Buro, 2011), thus suggesting that mindful students are more behaviourally engaged. However, to our knowledge, no study investigated the relationship between mindfulness and behavioural engagement. Also, some authors suggested that cognitive flexibility is a component of or related to mindfulness (Bishop et al., 2004; Moore, 2013; Sinnott et al., 2020). Mindful students were found to have a higher need for cognition, i.e., have higher engagement and enjoyment of cognitive activity (Brown & Ryan, 2003), but only one study (Napora, 2013) directly investigated the relationship between mindfulness and cognitive engagement amongst undergraduate students.

In addition, mindful students have been shown to engage more in adaptive emotion regulation strategies (Coffey et al., 2010), such as using more often positive cognitive reappraisal after perceived academic failure (Hanley et al., 2015), which enables them to have better emotion regulation. Thus, mindful students might be less nervous and worried in the classroom and while studying, i.e., they might have lower negative emotional engagement. However, there is a lack of studies investigating the relationship between mindfulness and negative emotional engagement.

As noted earlier, mindfulness may facilitate experiencing flow (e.g., Marty-Dugas et al., 2023) which, in turn, may facilitate students' engagement. Namely, flow is a highly enjoyable experience (Csikszentmihalyi, 1990), followed by an increase in positive affect (Rogatko, 2009), thus leading individuals to engage more in the same or similar activities. Mesurado et al.'s (2016) found that flow experiences during study activities (such as classes, exams, or academic tasks) may lead to higher academic engagement, whilst Smith et al. (2023) found that flow experienced in internal activities such as thinking and remembering were related to momentary engagement during a live undergraduate lecture. In addition, in an 8-month longitudinal study, Rijavec and Ljubin Golub (2019) found that experiencing flow in academic activities may buffer negative emotions and burnout. However, there is no research investigating the role of academic flow as the pathway between dispositional mindfulness and behavioural, cognitive, and emotional components of academic engagement.

Mindfulness, academic flow, and academic flourishing

Besides being engaged in academic activities, it is also important for students to heighten their well-being and flourish while studying. Keyes (2002) conceptualised flourishing in life as being filled with positive emotions and functioning well. Research showed that mindfulness is positively related to students flourishing in life, either directly or indirectly via higher coping competence or clarity of internal experiences (Akin & Akin, 2015; Coffey et al., 2010). Rijavec and Ljubin Golub (2017) proposed academic flourishing as a narrower concept referring to flourishing in the academic domain, in contrast to general flourishing in life. Academic flourishing is defined as a domain-specific concept that combines students' subjective and psychological well-being in the academic setting and reflects a sense of competence and self-confidence about one's studies, experiencing positive emotions, self-realisation in studying and the belief that studying is meaningful (Rijavec & Ljubin Golub, 2017). Academic flourishing was found to be positively associated with students' proactivity, autonomy support from teachers and academic flow in academic activities (Rijavec et al., 2021), with academic flow explaining 27% of the variance in academic flourishing. Facets of mindfulness differentially predicted general vs. academic flourishing amongst female students (Gajšek et al., 2023). However, only one study (Ljubin-Golub & Gajšek, 2022) investigated the mediating role of academic flow in the association between dispositional mindfulness and academic flourishing.

Objectives of the Study

This study intends to fill the gap in the literature by researching not only the relationship of dispositional mindfulness with behavioural, cognitive, and emotional components of academic engagement and academic flourishing, but also posits academic flow as a mediator underlying these relationships. Based on the concept that attention self-regulation is involved in both mindfulness (Bishop et al., 2004) and flow (Marty-Dugas et al., 2021; Nakamura & Csikszentmihalyi, 2005), and in line with previous research showing a positive relationship between mindfulness and flow (Schutte & Malouff, 2023), it is hypothesised that dispositional mindfulness is positively related to proneness to experience academic flow (H1).

Secondly, in relation to the research findings that mindfulness is related to lower procrastination (Howell & Buro, 2011), higher need and enjoyment of cognitive activity (Brown & Ryan, 2003), higher cognitive engagement (Napora, 2013) and better emotion regulation after academic failure (Hanley et al., 2015), it is hypothesised that dispositional mindfulness is positively associated with behavioural and cognitive engagement and negatively associated with negative emotional, anxious engagement (H2).

The present study also proposes that academic flow acts as a mediator in the relationship between dispositional mindfulness and each of the components of academic engagement. This hypothesis is based on research findings that mindfulness promotes attention processes (Jensen et al., 2012) which are important for deep and focused attention in flow (Marty-Dugas et al., 2021), that mindfulness is empirically associated with flow (Gajšek et al., 2023; Schutte & Malouff, 2023), and that both mindfulness (Elphinstone et al., 2019; Miralles-Armenteros et al., 2021) and flow experience (Cermakova et al., 2010; Mesurado et al., 2016) encourage academic engagement in undergraduate students. Therefore, it is hypothesised that dispositional mindfulness may facilitate academic flow, which in turn, would act as a pathway through which mindfulness heightens students' behavioural and cognitive engagement while lessening negative emotional engagement (H3). To understand the associations in these analyses, it is important to utilise a definition of engagement which differentiates between the behavioural, cognitive and emotional components of engagement (Fredricks et al., 2004) and does not overlap with the flow concept as in Schauefeli et al. (2002).

Besides academic engagement, this study investigates students' academic flourishing as an important indicator of psychological well-being in the academic domain. Based on the aforementioned research (Akin & Akin, 2015; Gajšek et al., 2023), we expected a positive relationship between dispositional mindfulness and academic flourishing (H4).

Finally, on the basis of the above presented theoretical reasoning, and the reported relationship between mindfulness and flow (Moore, 2013; Schutte & Malouff, 2023) and academic flow and flourishing (Rijavec et al., 2021), it is hypothesised that dispositional mindfulness would lead to higher academic flow which in turn, would lead to higher academic flourishing (H5).

Methodology

This quantitative, correlational study aimed to research students' experiences of mindfulness and academic flow and their association with academic engagement and flourishing. All variables were measured with self-report questionnaires.

Sample

The sample consisted of 270 university students. Participants were mostly female (77%), with an average age of 22 years (M = 22.1, SD = 1.78). They were registered at several public universities in Croatia, in disciplines such as biomedicine and medicine (10%), social sciences (62%), natural sciences (17%), computer sciences (10%) and arts (1%). The instruments were administered online as a Google Forms questionnaire which participants shared on social media in different student groups resulting in a convenience sample. All students

participated voluntarily and anonymously, with all procedures being in accordance with the ethical standards of the institutional research committee (Catholic University of Croatia), national research committee (University of Zagreb) and the Helsinki Declaration and its amendments or comparable ethical standards.

Instrument and Procedures

Four self-reported measures were used to assess study variables as a part of a broader survey.

Mindful Attention Awareness Scale (Brown & Ryan, 2003) measures disposition to mindful attention and awareness, i.e., individual differences in the frequency of mindful states over time. It has 15 items (e.g., "*I find it difficult to stay focused on what's happening in the present*") and participants rate the frequency of their experience using a 6-point Likert scale ranging from 1 (almost always) to a 6 (almost never). The level of dispositional mindfulness was expressed as an average of all items, whereby a higher result indicates higher proneness to dispositional mindfulness. The scale was previously translated and used on a Croatian sample and demonstrated good psychometric characteristics including factorial validity and reliability (Kalebić Jakupčević, 2014).

Swedish Flow Proneness Questionnaire (SFPQ; Ullén et al., 2012), previously adapted to assess flow in academic activities (SFPQ-A, Ljubin-Golub et al., 2018), was used to assess proneness to academic flow experience. This 7-item scale measures how frequently the respondent experiences flow in the academic domain by assessing concentration, challenge-skill balance, explicit goals, clear feedback, sense of control, lack of boredom and enjoyment (Ullén et al., 2012). Items were assessed on a scale ranging from 1 (never) to 5 (every day) (e.g., ''*When you are learning, doing assignments or projects for your studies, how often does it happen that…. e.g., what you do feels extremely enjoyable to do?*''). The total score was expressed as an average of these ratings, with higher result indicating a greater frequency of flow experiences in the academic domain. The SFPQ-A has previously demonstrated factorial validity and reliability in the Croatian sample (Ljubin-Golub et al., 2018).

Academic Engagement Scale (Rovan et al., 2016) measures behavioural, cognitive, and negative emotional (anxious) engagement in academic settings. It consists of three subscales: Behavioural Engagement Subscale (7 items, e.g., „*When I'm in class, I do the best I can*"), Cognitive Engagement Subscale (4 items, e.g., „*I relate the ideas that I learn in class with everyday life*"), and Negative Emotional (Anxious) Engagement Subscale (4 items, e.g., „ *I'm nervous while I study*"). Participants rated all items on a Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). The total average score for each subscale was used as an independent indicator of each engagement dimension. The scale demonstrated adequate psychometric characteristics (Ljubin-Golub et al., 2018), including a three-factor structure (Petričević et al., 2016).

Academic Flourishing Scale (Rijavec & Ljubin Golub, 2017) measures respondents' self-perceived flourishing in the academic domain. The scale consists of 6 items (e.g., "*Studying makes my life more meaningful*") which respondents rated on a Likert-type scale ranging from 1 (absolutely untrue) to 7 (absolutely true). The total score on this measure was expressed as an average of these ratings, whereby a

higher result indicates higher academic flourishing. Previously, the scale showed good psychometric characteristics (Rijavec et al., 2021).

As displayed in Table I, the measures used in this study demonstrated good to excellent reliability values.

Data Analysis

Prior to the analysis of the data, the data were screened, composite scores for all variables were calculated, and the appropriateness of all data for further analysis was verified. The values of skewness (< 0.567) and kurtosis (< 0.899) of the study variables are considered acceptable, according to Tabachnik and Fidell (2007). Descriptive statistics were calculated, and Pearson correlation coefficients were used to measure the degree of association between variables. Mediation hypotheses were tested using simple mediation analyses with SPSS macro PROCESS (Hayes, 2012) which provides an estimate of the indirect effect on the population by resampling the dataset k-times (with 2,000 bootstrap samples). An estimate of indirect effect is considered statistically significant if its 95% confidence interval (95%CI) does not include zero. To control for gender and age, these variables were included in the mediation analyses as covariates.

Results

Descriptive statistics, correlations among the study variables, and Cronbach's alpha

Descriptive statistics, bivariate associations and Cronbach's alpha are detailed in Table I. The results showed that students experienced both mindfulness and academic flow somewhat frequently and flourished in their studying. They were mostly cognitively engaged, followed by behavioural engagement, and were least negatively emotionally engaged, i.e., anxiously engaged.

Dispositional mindfulness was significantly and positively associated with academic flow, fully supporting H1. Dispositional mindfulness was significantly and positively associated with behavioural and cognitive engagement and negatively related with anxious engagement, thus supporting H2. In line with H4, dispositional mindfulness was significantly and positively associated with academic flourishing.

Experiencing academic flow was significantly related to academic engagement, i.e., positively to behavioural and cognitive engagement, and negatively to academic anxious engagement. Experiencing academic flow was significantly and positively associated with academic flourishing.

Table I

Descriptive statistics, correlations among the study variables, and Cronbach's alpha values

Variables	1.	2.	3.	4.	5.	6.
1. Mindfulness	-	.27**	.13*	.17**	-.33**	.23**
2. Academic flow		-	.37**	.38**	-.25**	.48**
3. Behavioural engagement			-	.37**	-.08	.30**
4. Cognitive engagement				-	-.16**	.54**
5. Negative emotional (anxious) engagement					-	-.31**
6. Academic flourishing						-
M	3.83	3.38	2.87	3.73	2.30	5.36
SD	0.80	0.56	0.99	0.99	0.82	1.19
Actual range	1.08-5.69	2-5	1-5	1-5	1-5	1-7
Theoretical range	1-6	1-5	1-5	1-5	1-5	1-7
Cronbach's alpha	.85	.76	.93	.84	.75	.91

Note. $^{*}p < .05$; $^{**}p < .01$.

Mediation analysis

The results of four simple mediation analyses with academic flow as a mediator in the relationship between mindfulness and students' academic engagement and academic flourishing are shown in Table II and Figure 4. In line with H3, there was a significant indirect effect of mindfulness on behavioural, cognitive, and negative emotional engagement via academic flow. The direct effect of mindfulness was significant for negative emotional engagement, but not for behavioural or cognitive engagement, showing that academic flow partially mediated the association between mindfulness and negative emotional engagement while fully mediated the relationship between mindfulness and both behavioural and cognitive engagement. The model explained 7.6% of the variance in academic flow and 15% of the variance in behavioural engagement, 17% of cognitive engagement, and 14% of negative emotional engagement.

The result of simple mediation analysis with academic flourishing as criteria supported H5. Since there was no significant direct effect but only an indirect effect, academic flow fully mediated the link between mindfulness and academic flourishing. The model explained 7.6% of the variance in academic flow while it explained 25% of the variance in academic flourishing.

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Table II

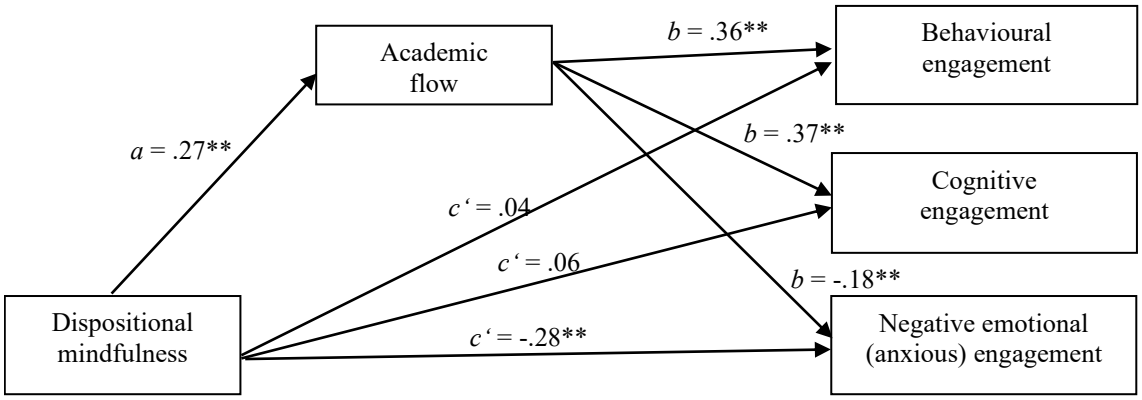
Results of mediations with academic flow as a mediator between mindfulness and criteria

Predictor	**Criteria**																	
	Behavioural engagement					Cognitive engagement					Negative emotional (anxious) engagement					Academic flourishing				
Mindfulness	*B*	*SE*	***t***			*B*	*SE*	***t***			*B*	*SE*	***t***			*B*	*SE*	***t***		
a	.19	.04	4.57**			.19	.04	4.57**			.19	.04	4.57**			.19	.04	4.57**		
b	.63	.10	6.15**			.65	.10	6.37**			-.26	.09	-2.97**			.96	.12	8.24**		
c	.17	.08	2.26*			.20	.07	2.69**			-.34	.06	-5.67**			.33	.09	3.72**		
c′	.05	.07	0.67			.08	.07	1.06			-.29	.06	-4.74**			.15	.08	1.78		
Indirect effect	***B***	***SE***	***LCI***	***UCI***		***B***	***SE***	***LCI***	***UCI***		***B***	***SE***	***LCI***	***UCI***		***B***	***SE***	***LCI***	***UCI***	
*a*b*	.12	.03	.06	.19		.12	.04	.06	.20		-.05	.02	-.09	-.01		.18	.05	.09	.29	

Note. **p* < .05; ***p* < .01; *a*= relationship between predictor and mediator, *b*= relationship between mediator and criteria, *c*= total effect, *c′*= direct effect, *a*b*= indirect effect, *B*= nonstandardized regression coefficients; SE= standard errors; LCI/UCI= lower/upper 95% confidence interval. Gender and age were included as covariates.

Figure 1

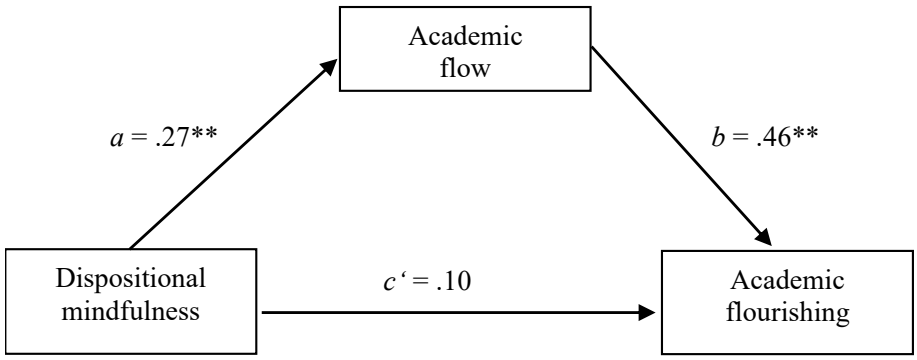
Results of mediation analyses with academic flow mediating the effects of mindfulness on students' academic behavioural, cognitive, and negative emotional (anxious) engagement (standardized coefficients).



Note. **$p < .01$

Figure 2

Results of mediation analyses with academic flow mediating the effects of mindfulness on students' academic flourishing (standardized coefficients).



Note. **$p < .01$.

Discussion

The present study tested the model in which experiencing flow in academic activities such as learning, doing assignments or preparing projects, mediated the relationship between mindfulness and students' academic engagement and academic flourishing. The mediation was complete for the cognitive and behavioural engagement, thus suggesting that the experience of academic flow was the sole mechanism, i.e., a pathway through which dispositional mindfulness led to higher behavioural and cognitive academic engagement. The results suggest that mindfulness leads to more frequent flow experiences in academic activities, and flow experiences stimulate intrinsic motivation, prompting students to actively engage in activities, both behaviourally and cognitively.

On the other hand, academic flow only partially mediated the relationship between dispositional mindfulness and anxious engagement, suggesting that there are also other mechanisms through which mindfulness may decrease anxious academic engagement. One of these mechanisms may be mindfully-derived emotional regulation since mindfulness was shown to be associated with effective emotion regulation (Coffey et al., 2010; MacDonald & Baxter, 2017). The other mechanism could be better competence in coping strategies since mindfulness was positively associated with coping competence in a stressful academic setting (Akin & Akin, 2015). Hanley et al. (2015) similarly found that mindfulness was associated with positive cognitive reappraisal following perceived academic failure.

In addition, the present study found that academic flow has a complete mediation role in the association between mindfulness and academic flourishing, suggesting that higher dispositional mindfulness facilitates the experience of academic flow, which is, in turn, a pathway to academic flourishing. These results are in line with the study of 209 university students by Ljubin-Golub & Gajšek (2022) which found that academic flow completely mediated the relationship between the mindfulness components of observing, describing, non-judgement and non-reacting, and academic flourishing, while partially mediated the relationship between acting with awareness and academic flourishing. It seems that the mindfulness-academic flourishing relationship is mediated by academic flow, while the mindfulness-general flourishing relationship is mediated by emotional regulation (MacDonald & Baxter, 2017).

This study confirmed the expected, but under-researched positive association of mindfulness with behavioural and cognitive engagement and the negative association with anxious (negative emotional) engagement, suggesting that students who are more mindful are more behaviourally and cognitively engaged in the classroom. Mindful students pay more attention in class, do their best when in class, try to understand the material while studying and relate what they learn in class to everyday life, and are not tense and worried while in class. The positive relationship between mindfulness and cognitive engagement is in line with previous research (Napora, 2013).

The positive relationship between mindfulness and academic flourishing found in the present study indicate that mindful students perceive study tasks as meaningful, associate studying with more positive emotions, and believe that studying helps them to fulfil their potential, thus making their lives more meaningful. These results extend previous findings on the relationship between mindfulness and general

flourishing (Akin & Akin, 2015) specifically to the academic domain. They are in line with previous studies with university students in Croatia (Gajšek et al., 2023; Ljubin-Golub & Gajšek, 2022). In a study with Croation students majoring in preschool education, Gajšek et al. (2023) found that academic flourishing was bivariatly associated with acting with awareness and the describing component of mindfulness, while general flourishing was related to these components but also to non-judgemental and non-reactivity components, thus suggesting the different values of distinct mindfulness components for academic versus general flourishing.

The positive association between dispositional mindfulness and proneness to experience academic flow found in the present study is in line with previous research amongst university students (Gajšek et al., 2023). There may be several reasons underlying this relationship. First, mindfulness shares attentional processes with flow (e.g., Marty-Dugas et al., 2023). Mindfulness derives present-moment attention to the task at hand (Bishop et al., 2004), thus providing focused concentration which is a key component to experience flow (Csikszentmihalyi, 1990). Second, mindfulness buffers negative emotions such as anxiety (Brown & Ryan, 2003) that usually hinder experiencing flow (Csikszentmihalyi, 1990). Mindfulness training increases flow experience (e.g., Marty-Dugas et al., 2023), which also underlines mindfulness as a pathway to flow experiences.

The relationship between flow and engagement is also worth noting. The flow theory posits that high engagement with a task is crucial for experiencing flow (Csikszentmihalyi, 1990), thus suggesting that engagement leads to flow experiences. On the other hand, since the experience of flow is extremely positive, it may lead individuals to engage more in the activity, thus suggesting that flow leads to further engagement. A previous study (Ljubin Golub et al., 2018) suggested that higher behavioural and cognitive, and lower anxious engagement, facilitate experiencing academic flow. This study and studies by Mesurado et al. (2016) and Huang (2024) suggest that experiencing academic flow may facilitate student engagement. It may well be that the relationship is bidirectional, i.e., engagement leads to flow which, in turn, may lead to further engagement.

The current study further found that academic flow was positively associated with academic flourishing, similar to research by Rijavec et al. (2021), and in line with research showing that flow in learning is associated with higher student satisfaction (Rijavec et al., 2016) and feelings of happiness while learning (Rogatko, 2009). This finding confirms the role of academic flow in students' well-being, in line with flow theory (Csikszentmihalyi, 1990).

Limitations and directions for future studies

First, although the sample comprised university students from various faculties, further research is needed to establish whether the results may be generalised to other student populations (e.g., part-time students, college students, etc.). Further, the study is focused on a Croatian sample which also limits the generalisability of the results. Second, the study did not control for students' immigrant status or socio-economic factors, while such factors are related, although weakly, to different academic outcomes (Rodríguez-Hernández et al., 2020) and therefore may also be important for academic engagement and flourishing. Third, the study is correlational

which limits its scope in making causal claims. Further experimental and longitudinal studies are required to confirm the causal relationship and to reveal the potential dynamic and reciprocal relationship between the study's variables. We also used a self-constructed scale to measure engagement and therefore caution is required when comparing our results to the results of the other studies. The scale does not include a measure of positive emotional engagement and further studies of the relationship between mindfulness and positive emotional engagement are required. It would be also interesting to further investigate the relationship between dispositional mindfulness and flow experienced in other domains besides academia, such as work, leisure, or sports.

Conclusions and Implications

This study has both theoretical and practical implications. First, the study showed the expected but under-researched positive association between dispositional mindfulness and flow experienced in academic activities. Second, the study found that mindful students are more behaviourally and cognitively engaged in their studies and flourish more in their academic lives. Finally, the most important finding of the study is that it highlighted the key mediational role of academic flow in the association between mindfulness and academic outcomes. Experiencing academic flow fully mediated the relationship between mindfulness and higher behavioural and cognitive academic engagement, as well as higher academic flourishing, suggesting that experiencing academic flow is the key mechanism by which mindfulness translates to higher students' engagement and flourishing.

With regards to the practical implications of the study, both mindfulness and experiencing academic flow seem to be compelling drivers of students' academic engagement and academic flourishing and thus should be nurtured and facilitated in the academic setting through mindfulness-based programmes and flow-inducing settings and activities. This study finding hence contributes to the literature by indicating that dispositional mindfulness and propensity for experiencing academic flow have important roles for students in higher education in order to become more academically, i.e., cognitively and behaviourally, engaged in the classroom and flourish in their studies.

Disclosure and conflicts of interest

The authors confirm that they do not have any conflicts of interest in this study.

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