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Coaching college students in the development of positive learning dispositions: A randomized control trial embedded mixed-methods study

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Abstract

Enhancing college students' learning habits, attitudes, and capacities have been an important research topic in educational psychology. In this study, we designed, implemented, and evaluated a coaching program that integrated mindful agency coaching and motivational interviewing for the development of positive learning dispositions in college students. A randomized control trial embedded mixed-methods design was employed. The quantitative phase with two experimental groups showed that the intervention group ($n = 24$) showed significant improvement in mindful agency, self-efficacy, learning motivation, and emotional intelligence after the coaching, compared with the control group ($n = 30$). The qualitative phase with students in the intervention group ($n = 15$) revealed five themes: Task orientation, motivational management, openness and acceptance, self-awareness and self-regulation, and supporting factors for coaching. Integrated findings demonstrated whether and how coaching could be a promising approach to enhancing college students' various positive dispositions that are essential for them to be mindful, resilient, and self-directed learners.

KEYWORDS
coaching, college students, learning dispositions, mindful agency, mixed methods

1 | INTRODUCTION

Learning dispositions can be regarded as clusters of learning habits, tendencies, states of readiness, attitudes, intentions, and a set of requisite capacities that motivate, activate, and direct human abilities and allow the preferences to be realized in a particular manner (Choi, 2017; Costa & Kallick, 2014; Evans & Waite, 2010; Perkins, Jay, & Tishman, 1993; Ritchhart, 2002). Mindful agency is an emerging concept of learning disposition (Peng & Wang, 2020; Q. Wang & Peng, 2017). In this study, we aimed to provide a detailed description of an in-depth exploration of how we designed, implemented, and evaluated an integrated coaching program (a combination of mindful agency coaching and motivational interviewing [MI] approach) that cultivated mindful agency and various related learning dispositions in college students.

2 | LEARNING DISPOSITIONS AND MINDFUL AGENCY

There are various lists and categories of learning dispositions (e.g., Claxton, Chambers, Powell, & Lucas, 2011; Costa & Kallick, 2008; Ennis, 1996; Facione, Sanchez, Facione, & Gainen, 1995) and these lists have a great level of overlapping. For example, resilience, perseverance, open-mindedness, reflectiveness, critical thinking, being strategic about learning, interdependence, collaboration, and meta-cognition or meta-learning commonly appear in these lists. The core learning disposition this study focused on was mindful agency.

The term mindful agency was theoretically rooted in self-determination theory (Deci & Ryan, 2008; Ryan & Deci, 2000), agency theories (Adair, 2014), hope theories (Schultz & Ryan, 2015), mindfulness (Kabat-Zinn, 1990; Langer, 2000), and flow theory (Ersöz, 2016). The concept was originally proposed by Deakin-Crick, Huang, Ahmed Shafi, and Goldspink (2015) in their analysis of learning power and later revised by Q. Wang and Peng (2017). They coined mindful agency as "a positive learning disposition that involves a strong sense of autonomy, authenticity, competences, intentionality, and self-awareness in observation, management, and regulation of the motivational, cognitive, emotional, and social processes that individual needs to be able to engage in effective learning to achieve his or her own learning goals" (p. 148). They further identified a five-factor structure of mindful agency: Learning methods, emotion regulation, awareness of planning, openness to experience, and learning engagement (see Table 1).

A number of learning dispositions are conceptually associated with mindful agency: The ability to recognize and manage emotions or feelings in the learning process (Martins, Ramalho, & Morin, 2010); the awareness and effective use of both intrinsic and extrinsic motivations (Deci & Ryan, 2008); self-efficacy beliefs in capabilities to organize and execute the courses of action required to manage prospective situations (Bandura, 1995); and

TABLE 1 Five factors of mindful agency

Five factors	Definition
1. Learning methods	Being able to adopt different methods accordingly and flexibly in various learning activities.
2. Emotion regulation	The ability to regulate negative emotions when face obstacles and challenges, and self-motivate when feeling frustration and anxiety in learning.
3. Awareness of planning	Being aware of goals, assignments, and strategies when approach particular learning tasks.
4. Openness to experience	Being open and accepting of one's own learning experience (either positive or negative), and acknowledge them as natural parts of the learning journey.
5. Learning engagement	Deep immersion, active participation, and profound intrinsic motivation in learning.

meta-cognition, the knowledge and regulation of cognition (Cross & Paris, 1988; Flavell, 1979). Developing certain learning dispositions may trigger the improvement in associated dispositions (Peng & Wang, 2020). Thus, students' self-efficacy, learning motivation, emotional intelligence, emotion regulation, and meta-cognition were also examined in the current study.

3 | IMPORTANCE OF LEARNING DISPOSITIONS FOR COLLEGE STUDENTS

In this section, we provided a brief review of the essential role that learning dispositions play in college students' learning process. Mindful agency is positively correlated with academic emotion (Q. Wang & Zhang, 2016), learning strategy regulation abilities (Q. Wang & Ar, 2016), and creativity on the dimension of fluency and originality (Q. Wang & Hu, 2016). Mindful agency predicted positively a deep approach to learning through the mediator of need for cognition (Q. Wang & Pan, 2018) and negatively academic procrastination (Q. Wang & Yu, 2016) and test anxiety (Q. Wang & Zhang, 2016). A recent intervention study reported that improvement in mindful agency mediates the changes in self-efficacy, emotional intelligence, and meta-cognition after coaching (Peng & Wang, 2020).

For the other learning dispositions involved in this study, self-efficacy has been found to be significantly related to college students' persistence (Chemers, Hu, & Garcia, 2001), adjustment (Ramos-Sánchez & Nichols, 2007), academic aspiration (Fong et al., 2017), career development (Wright, Jenkins-Guarnieri, & Murdock, 2012), academic performance (Honicke & Broadbent, 2016; Richardson, Abraham, & Bond, 2012; Robbins et al., 2004). Learning motivation is strongly related to college students' learning engagement, persistence, and academic achievement (Alt, 2015). Meta-cognition positively influences students' academic achievement (Ohtani & Hisasaka, 2018). Emotional intelligence is positively related to students' wellbeing, perceived competency (Por, Barriball, Fitzpatrick, & Roberts, 2011), and academic performance (Hogan et al., 2010). Lastly, emotion regulation is an essential skill for successful peer relationships (Arguedas, Daradoumis, & Xhafa, 2016), psychological and physical wellbeing (Romanelli, Cain, & Smith, 2006), and college students' retention and academic success (Perera & DiGiacomo, 2015). Taking the evidence above collectively, our study asked the following critical question: How can these learning dispositions be developed systematically and effectively?

4 | DEVELOPING POSITIVE LEARNING DISPOSITIONS

Dispositions can be intentionally learned, cultivated, and developed through reframed curricula in formal schools, informal education, training, and coaching (Lucas, Claxton, & Spencer, 2013). In the case of mindful agency, it can be systematically developed through a series of group coaching activities (Peng & Wang, 2020; Q. Wang, Law, Li, Xu, & Pang, 2017). The coaching is based on three well-established approaches in psychological science: (a) The positive psychology approach that encourages students to use personal strengths and virtues in life as well as build positive emotions, engagement, and meaning (Marrero, Carballeira, Martín, Mejías, & Hernández, 2016; Seligman, 2007; Seligman, Steen, Park, & Peterson, 2005), (b) the mindfulness-based approach that adopts meditation activities from mindfulness-based stress reduction (MBSR, Kabat-Zinn, 1990) and mindfulness-based cognitive therapy (MBCT, Segal, Williams, & Teasdale, 2002) to enhance students' self-awareness, emotion regulation ability, and cognitive function (Worthen & Luiselli, 2017), and (c) the narrative approach that uses the power of storytelling for students to create their personal narrative or dominant stories, and further understand and give meaning to their lives and to themselves (McAdams & McLean, 2013; Olsen, 2015).

In addition, MI (Miller & Rollnick, 2002), a directive, client-centered counseling style for eliciting behavior change, has been used as a one-on-one coaching approach to address specific student learning issues and develop their confidence and motivation to make changes. MI has been gradually found to be effective in education settings (Lee, Frey, Herman, & Reinke, 2014; Reich, Sharp, & Berman, 2015; Snape & Atkinson, 2015) in terms of helping students improve confidence in learning, academic performance, school-based motivation, self-efficacy, and stress reduction (Snape & Atkinson, 2016). It has also been proposed to increase implementation fidelity in the context of a coaching relationship (Lee et al., 2014).

A narrative-oriented inquiry study showed that mindful agency coaching can strengthen students' strategic awareness and planning of learning, self-acceptance and self-confidence, and communications and collaboration with peers in learning (Q. Wang et al., 2017). However, this study only collected narrative data from student participants' reflective journals in group-based workshops and provided no quantitative evidence on the effectiveness of mindful agency coaching. A recent intervention study employed a quasi-experimental design of three groups to examine the effectiveness of mindful agency coaching and MI on the development of learning dispositions (Peng & Wang, 2020). The study found that the interventions can help college students enhance mindful agency, self-efficacy, and emotional intelligence. However, the study did not provide participants' perceptions of the coaching process or further explanation of why the coaching worked in developing certain learning dispositions. Therefore, our current study aimed to address the research niche that generates a deeper understanding of developing positive learning dispositions in college students using a coaching approach.

4.1 | The current study

In the current study, we attempted to examine whether a comprehensive coaching program that integrated both mindful agency coaching and MI approach in coaching (MACP) would promote college students' positive learning dispositions of mindful agency, self-efficacy, learning motivation, emotional intelligence, emotion regulation, and meta-cognition. In addition, we aimed to elucidate the critical elements involved in the development of learning dispositions by investigating participants' authentic experiences in MACP. The specific research questions of this study are as follows:

Research question 1: Is MACP effective in developing students' learning dispositions in the experimental group compared with students who were not involved in the coaching program?

Research question 2: What are the critical factors in the process of developing learning dispositions according to participants' experiences of MACP?

5 | METHODS

5.1 | Research design

The current study employed a mixed-methods sequential explanatory design (J. W. Creswell, 2003) with a quantitative phase followed by a qualitative phase (see Figure 1). First, we collected quantitative data to examine the effectiveness of MACP on the development of students' learning dispositions using a randomized control trial (RCT) design. Second, the analytical results furnished in the quantitative phase were used to guide the purposeful qualitative exploration of participants' experiences and perceived changes in the qualitative phase. The sequential explanatory approach helped us grasp how MACP could facilitate the cultivation of these positive learning dispositions and uncover the key issues in participants' experiences. The quantitative and qualitative data collection and the analyses were given equal importance.
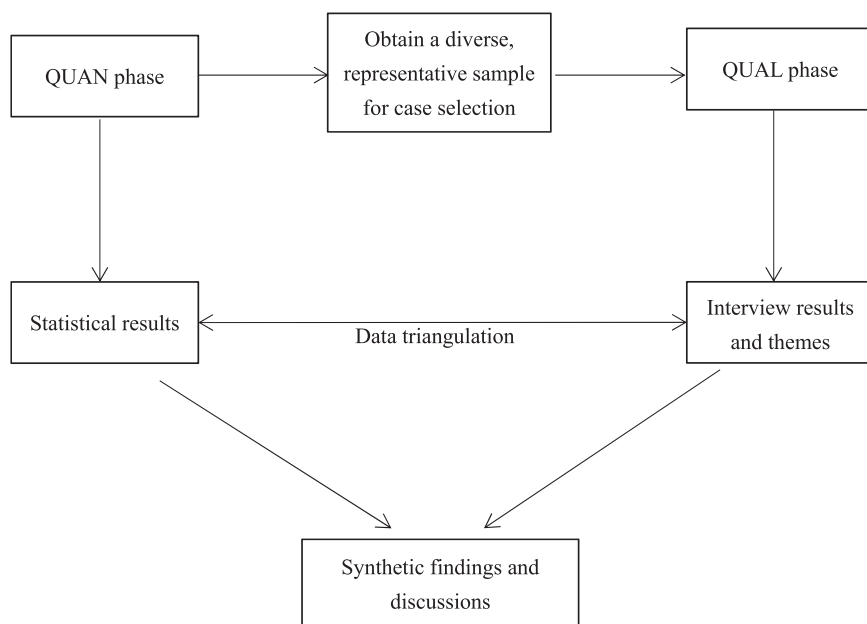
FIGURE 1 Mixed-method sequential explanatory design (Adapted from Hesse-Biber, 2010)

5.2 | Participants

The study was approved by the University Committee on Human Research Protection in the authors' affiliated institution. Participants were informed of the research purpose, and they signed informed consent forms. They were aware of their right to withdraw at any stage in the research. Participants who attended the semistructured interviews in the qualitative phase were explicitly informed that the interviews would be recorded. To protect individual privacy, we anonymized the interviewees and kept personal information confidential.

In the quantitative phase, we recruited 60 college students taking psychology as their second major in a metropolitan city in China. We then assigned the participants randomly to an intervention group ($n = 30$), in which participants received MACP, and an active control group ($n = 30$), in which participants were asked to write down their everyday activities during the same period. Only data from those who completed pretests and posttests were included in the statistical analysis. The final sample consisted of 54 participants, aged from 18 to 24 years ($M = 20.3$ years, $SD = 1.19$ years). There were 30 participants in the active control group including 28 females and 2 males. The intervention group included 24 participants, with 21 females and 3 males. Their first majors were art ($n = 33$), science ($n = 16$), engineering ($n = 2$), social science ($n = 2$), and medicine ($n = 1$). The flowchart of the recruitment of participants is demonstrated in Figure 2.

In the qualitative phase, 15 students in the intervention group voluntarily attended face-to-face interviews (women = 14, men = 1). The participants' ages ranged from 19 to 24 years ($M = 20.7$ years, $SD = 1.62$ years). Independent t tests separately at T1 and T2 revealed that the representative sample showed no difference from those who did not attend the interviews in the intervention group in the six learning dispositions at both T1 ($ps > .15$) and T2 ($ps > .09$). Their majors covered art ($n = 6$), science ($n = 6$), engineering ($n = 1$), social science ($n = 1$), and medicine ($n = 1$). The detailed information of these participants can be found in Table 4.
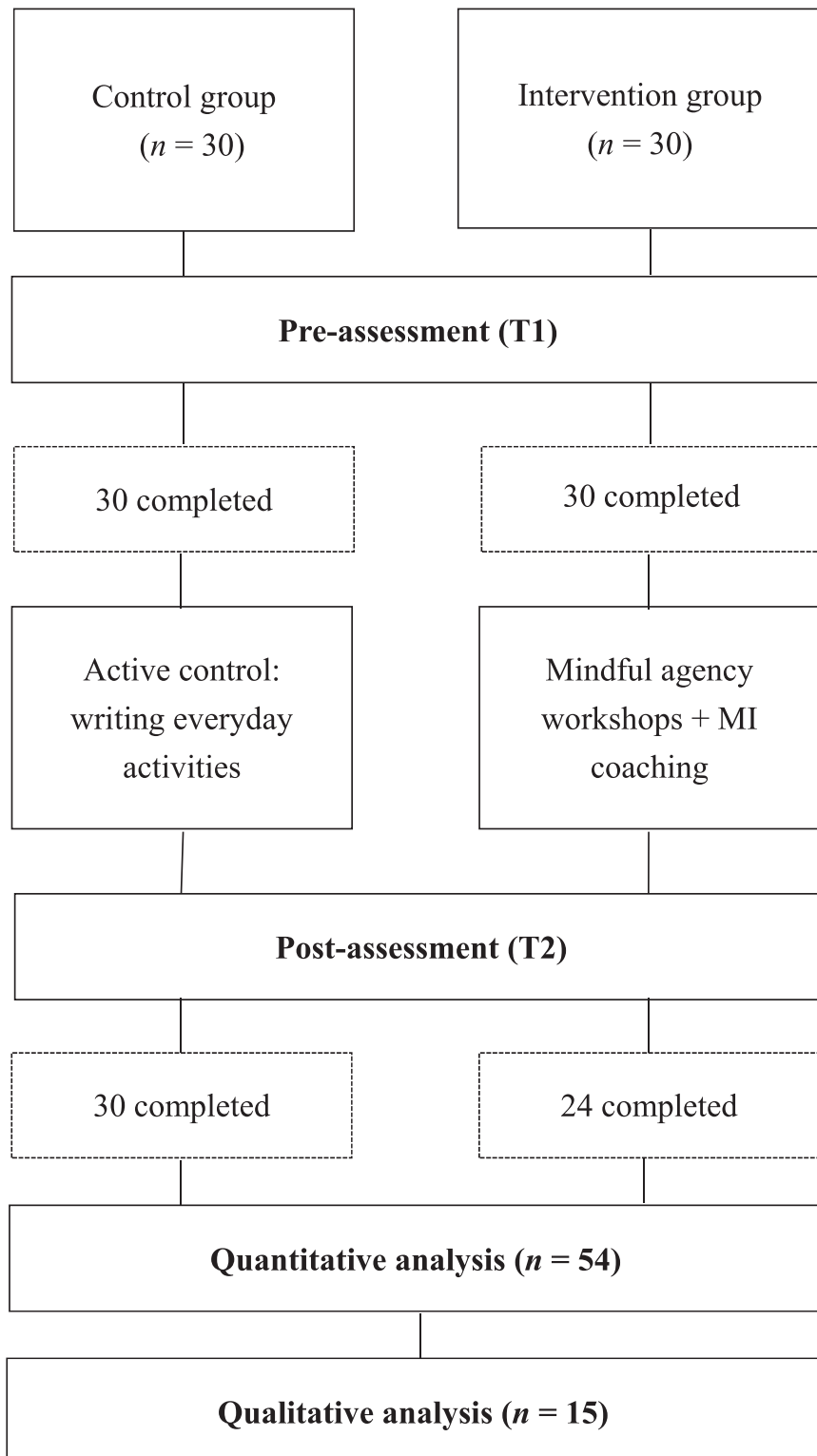
FIGURE 2 Overview of the participants' flow. MI, motivational interview

5.3 | Measures

5.3.1 | Mindful Agency Scale (MAS)

Mindful agency was assessed by MAS (Q. Wang & Peng, 2017). This 20-item Chinese scale was rated from 1 (*it never applies to me*) to 6 (*it always applies to me*). MAS consists of five subscales, learning method (e.g., "I know that if I have sufficient time to think over, I can find the way to solve the problem"), emotional regulation (e.g., "When I feel frustrated with my studies, I am very good at finding ways to make myself find the feeling of learning"), awareness of planning (e.g., "Usually I can predict how long it will take for me to learn something"), openness to experiences (e.g., "I believe that any experience in learning is meaningful"), and learning engagement (e.g., "Usually I can focus on what I am doing at this moment"). In the current study, the Cronbach's αs were .78 (T1) and .80 (T2).

5.3.2 | General Self-Efficacy Scale (GSES)

Self-efficacy was assessed by the Chinese validated version of GSES (C. Wang, Hu, & Liu, 2001) based on the English version (Schwarzer, Bäßler, Kwiatek, Schröder, & Zhang, 1997). This 10-item scale was rated from 1 (*not at all true*) to 4 (*exactly true*). An example of an item was "It is easy for me to stick to my aims and accomplish my goals". In the current study, Cronbach's α was .88 at both T1 and T2.

5.3.3 | Working Preferences Inventory (WPI)

Learning motivation was assessed by the Chinese validated version of WPI (Chi & Xin, 2006) revised from the original version (Amabile, Hill, Hennessey, & Tighe, 1994). This 30-items scale was rated from 1 (*never true to me*) to 4 (*always true to me*). WPI was commonly used to assess individual differences in intrinsic motivation (e.g. "I enjoy tackling problems that are completely new to me") and extrinsic motivation (e.g. "I believe that there is no point in doing a good job if nobody else knows about it"). In the current study, the Cronbach's αs were .74 (T1) and .83 (T2) for intrinsic motivation, .70 (T1) and .64 (T2) for extrinsic motivation.

5.3.4 | Emotional Intelligence Scale (EIS)

Emotional intelligence was assessed by a Chinese validated version of EIS (Y. Huang, Lv, Wang, & Shi, 2008) based on the English version (Schutte et al., 1998). This 33-item scale was rated from 1 (*strongly disagree*) to 5 (*strongly agree*). An example of an item was "I enjoy sharing my feelings with others". In the current study, Cronbach's αs were .71 (T1) and .78 (T2).

5.3.5 | Emotion Regulation Questionnaire (ERS)

Emotion regulation was assessed by the Chinese validated version of ERS (L. Wang, Liu, Li, & Du, 2007) based on the original questionnaire (Gross & John, 2003). This 10-item scale was rated from 1 (*strongly disagree*) to 7 (*strongly agree*). Two emotion regulation strategies were measured: Cognitive reappraisal (attempt to change the emotional impact of a situation by reinterpreting its meaning, e.g., ''When I'm faced with a

stressful situation, I make myself think about it in a way that helps me stay calm'') and emotional suppression (attempt to inhibit the overt expression of emotions, e.g., ''I keep my emotions to myself''). In the study, Cronbach's αs were .70 (T1) and .83 (T2) for cognitive reappraisal and .66 (T1) and .75 (T2) for emotional suppression.

5.3.6 | Meta-Cognitive Ability Questionnaire (MCAQ)

Meta-cognition was assessed by a 24-item Chinese-version questionnaire (Kang, 2005). MCAQ rated from 1 (*never true*) to 5 (*always true*). An example of an item was "I use different learning strategies under different circumstances". In the current study, the Cronbach's α was .85 at both T1 and T2.

5.4 | Intervention

The intervention followed the completed program of MACP (Peng & Wang, 2020; Q. Wang et al., 2017). In mindful agency coaching (see Table 2a), student participants were coached by a licensed coaching psychologist and facilitated by four assistants who were professionally trained in coaching. Coaching was

TABLE 2a Mindful agency coaching (Q. Wang et al., 2017)

Stage	Focus	Main activities	Aims
Session 1: 3 hr	Mindful agency and learning	• Introduce the concept of mindful agency • Explicate the relation between mindful agency and learning • Explore students' values, reasons, motivation, and resources in learning	• Foster a sense of agency, ownership, responsibility • Enhance the intrinsic motivation
Session 2: 3 hr		• Explain mindfulness and its characteristics • Prepare the attitudes of mindful practice • Bodily sensation; mindful breathing; mindful moving; body scans; eating, sitting, and walking meditation; Love-kindness meditation • Make personally tailored mindfulness practice	• Develop self-awareness • Deepen reflexivity • Cultivate self-management and self-discipline
Session 3: 3 hr	Narrative-based coaching	• Discuss storytelling and narrative psychology • Personal narrative: Writing a letter for yourself in 10 years • Narrative in pairs: Reconstruction of stories and self • Group narrative: A journey to the West	• Develop learning engagement • Cultivate self-management and self-discipline • Develop self-directed and collaborative learning ability
Session 4: 3 hr	Reviewing, sharing, and reflecting on the coaching	• Explore generative moments in learning • Reveal character strengths • Share experiences of mindful agency coaching • Self-evaluation of growth as a learner	• Foster self-knowledge and self-awareness • Explore personal resources • Track the progress of learner's identity

delivered across four separate days, including activities designed to help students develop agency and ownership of learning, explore personal resources, enhance self-awareness and self-management, cultivate a sense of goal-striving and hope, develop learning engagement and intrinsic motivation, and track the progress of their identity as a learner. Participants were further invited to one-on-one MI coaching that focused on their learning issues and ways to implement changes (Table 2b). The students were randomly assigned to one of five interviewers who were professionally trained in MI. Each participant engaged in four to five sessions, each lasting 50 min. The procedure of MI included four general steps: Engaging, focusing, evoking, and planning. In the final session of MI coaching, the participants were asked to give feedback on their experience.

5.5 | Data collection and analysis

5.5.1 | Phase I: Quantitative data collection and analysis

Participants' positive learning dispositions were measured before the intervention (T1) and again 2 weeks after the intervention (T2).

The pretest and posttest data were analyzed using SPSS 20.0. A 2×2 (treatment × time) doubly multivariate analysis of variance was completed, with treatment (intervention group or active control group) as the between-subjects factor, and time of assessment (pretest or posttest) as the within-subjects factor, to examine whether the two groups differed significantly over T1 and T2 in six learning dispositions.

TABLE 2b Motivational interviewing coaching

Stage	Focus	Main activities
Engaging: 50 min	Developing mutual trust and rapport	• Establish a positive relationship between coach and participants • Explore potentials for development and growth • Explore the gap between the status quo and the desired status • Collaborate on mutually negotiated tasks to achieve the desired status
Focusing: 50 min	Clarifying goals; seeking and maintaining direction	• With clear focus: Directly enter the evoking process • With several focuses: Enumerate possibilities, compare choices, and decide on the central focus • Without focus: Explore directions for improvement, concrete the big goal, set up a goal with a joint agreement
Evocating: 50 min	Uncovering desires to change and preparing for actions through discourses	• Speak out the confliction, observe discourses to change direction, and get rid of ambivalence • Express motivation in an accepting, affirming, and non-judgmental relationship • Clarify the desires, capacities, reasons, and needs
Planning: 50 min	Making action plans	• Clarify each step to reach the goal and fulfill the change • Imagine the potential obstruction, figure out the solution • Develop self-coaching plan after the completion of motivational interviewing coaching

5.5.2 | Phase II: Qualitative data collection and analysis

We conducted the qualitative phase two weeks after the completion of the intervention. Guided by open-ended questions, we designed the semistructured interviews to elicit information from participants on their perceived changes in learning, the most impressive activities in MACP, and the ways that could help them further develop learning dispositions. The interviews were held in a quiet, private room on campus, lasting 30 to 50 min and with an average duration of 40 min. The interviews were audio-recorded and then transcribed verbatim.

The analysis of interview data followed the principles of grounded theory (Glaser & Strauss, 1967). Each interview transcript was coded independently by two research assistants to ensure the accuracy and credibility of coding. The coding process followed four steps: (a) Data familiarizing by reading the transcripts repeatedly and carefully, (b) initial coding, in which important sections in the text were extracted, yielding over 60 open codes, (c) themes searching and reviewing, in which we considered the relations between codes and categorized them into subthemes, and then identified new themes that would potentially provide additional insight into the experience students encountered during coaching, and (d) theory coding, in which a theoretical model was generated to illustrate the relationship among the themes and describe the key components of mindful agency development. We systematically reviewed the transcripts to ensure the set of data identified remained intact and then drafted the theory model.

6 | RESULTS

6.1 | Quantitative findings

The majority of the participants completed the MACP (80%). Pretreatment and posttreatment descriptive data for all participants and comparisons of outcome variables between the intervention group and the active control group are presented in Table 3.

Results of the multivariate assessment indicated that there was a significant interaction between treatment and time, Wilks's $\lambda = 0.66$, $F(6, 47) = 4.11$, $p = .002$, $\eta^2 = 0.34$. In addition, there was a significant main effect of time, Wilks's $\lambda = 0.63$, $F(6, 47) = 4.54$, $p = .001$, $\eta^2 = 0.37$, and a significant main effect of treatment, Wilks's $\lambda = 0.69$, $F(6, 47) = 3.54$, $p = .006$, $\eta^2 = 0.31$.

The follow-up univariate analyses were conducted to determine whether the interaction of time and treatment type were similar in all six measures. Significant treatment by time interaction effects was found for MAS, $F(1, 52) = 18.01$, $p < .001$, $\eta^2 = 0.26$, GESE, $F(1, 52) = 5.70$, $p = .021$, $\eta^2 = 0.10$, EIS, $F(1, 52) = 12.55$, $p = .001$, $\eta^2 = 0.19$, and MCAQ, $F(1, 52) = 8.65$, $p = .005$, $\eta^2 = 0.14$, indicating that changes from T1 to T2 regarding these four variables were different in the two groups (Table 3). No treatment by time interaction was found for WPI, $F(1, 52) = 1.60$, $p = .21$, $\eta^2 = 0.03$, and ERS, $F(1,52) = 0.41$, $p = .53$, $\eta^2 = 0.01$, showing that change on these WPI, ERS was similar for both groups. Significant time effects were found in MAS, $F(1, 52) = 12.97$, $p = .001$, $\eta^2 = 0.20$, and GSES, $F(1, 52) = 10.37$, $p = .002$, $\eta^2 = 0.17$. And significant treatment effects were found in MAS, $F(1, 52) = 6.37$, $p = .015$, $\eta^2 = 0.11$, WPI, $F(1, 52) = 7.11$, $p = .010$, $\eta^2 = 0.12$, and EIS, $F(1, 52) = 15.88$, $p < .001$, $\eta^2 = 0.23$.

No significant effect of time, treatment, or time by treatment interaction were found in ERS, suggesting that the two groups had no significant change in ERS with time passed by, and there were no significant group differences in ERS at both T1 and T2. Thus, further pairwise comparisons with Bonferroni correction were conducted in the other five measures. Results showed that there were no significant differences between the two groups at T1 ($ps > .05$). However, the intervention group had higher scores than the control group in MAS ($p < .001$, $t = 5.19$, $d = 1.40$), GSES ($p = .015$, $t = 2.52$, $d = 0.68$), WPI ($p = .003$, $t = 3.14$, $d = 0.86$), and EIS ($p < .001$, $t = 5.46$, $d = 1.48$) at T2, whereas no significant group difference was found at T2 in MCAQ

TABLE 3 Descriptive statistics $(M \pm SD)$ and comparison of the control and intervention group

Measures (variable)	T1		T2		Effect time			Effect time × Group		
	Control group	Intervention group	Control group	Intervention group	F	p Value	η^2	F	p Value	η^2
MAS (Mindful agency)	4.20 ± 0.46	4.19 ± 0.53	4.16 ± 0.33	4.68 ± 0.40	12.97	.001**	0.20	18.01	<.001***	0.26
GSES (Self-efficacy)	2.43 ± 0.49	2.42 ± 0.52	2.49 ± 0.36	2.79 ± 0.51	10.37	.002**	0.17	5.70	.021*	0.10
WPI (Learning motivation)	2.85 ± 0.20	2.95 ± 0.24	2.83 ± 0.19	3.00 ± 0.20	0.24	.628	0.01	1.60	.211	0.03
EIS (Emotion intelligence)	3.80 ± 0.24	3.93 ± 0.25	3.70 ± 0.20	4.03 ± 0.25	0.001	.972	<0.001	12.55	.001**	0.19
ERS (Emotion regulation)	4.55 ± 0.44	4.61 ± 0.56	4.48 ± 0.66	4.64 ± 0.43	0.09	.770	0.002	0.41	.527	0.01
MCAQ (Meta-cognition)	3.56 ± 0.41	3.40 ± 0.33	3.48 ± 0.33	3.64 ± 0.41	2.10	.153	0.04	8.65	.005**	0.14

Abbreviations: EI, Emotion Intelligence Scale; ERS, Emotion Regulation Scale; GESE, General Self-Efficacy Scale; M, mean; MAS, Mindful Agency Scale; MCAQ: Meta-Cognition Ability Questionnaire; WPI, Working Preference Inventory.

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

TABLE 4 Detailed information of the 15 interview participants

Pseudonym	Age (years)	Major	Gender (F = female, M = male)	M_{MAS}		M_{GESE}		M_{WPI}		M_{EIS}		M_{ERS}		M_{MCAQ}	
				T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
Yu	20	Science	F	3.75	4.00	2.70	2.40	2.47	2.63	3.73	3.73	4.40	3.90	3.83	3.17
Xue	24	Science	F	3.56	4.31	2.04	3.00	3.03	3.13	3.97	3.91	3.70	3.90	3.50	4.00
Ru	20	Art	F	4.94	4.69	3.80	3.20	3.43	3.30	4.42	4.30	5.20	4.20	3.54	3.79
Na	24	Engineering	F	4.56	4.44	2.50	2.70	3.33	3.00	4.21	3.85	5.00	4.60	3.00	2.58
Ting	19	Social science	F	5.25	5.10	2.80	3.10	2.97	2.87	3.88	3.91	4.50	4.40	3.63	3.92
Qi	20	Art	F	3.19	4.13	1.70	1.60	3.17	3.27	3.76	4.06	5.30	4.90	3.04	3.33
Min	20	Medicine	F	4.88	5.00	1.90	3.40	2.87	3.07	4.09	4.33	3.70	4.10	3.38	3.67
Fang	21	Science	F	4.56	5.56	3.30	3.90	2.80	2.97	4.30	4.48	4.70	5.00	3.88	4.46
Feng	20	Art	F	3.19	4.75	1.50	3.10	2.90	2.83	3.48	3.91	3.60	4.90	2.71	3.33
Ye	19	Art	F	4.50	4.34	2.40	2.50	2.83	2.97	3.58	3.83	4.80	4.25	2.96	3.27
Wei	20	Art	F	4.44	4.75	2.40	2.80	3.23	2.83	4.12	4.24	5.00	5.20	3.54	4.04
Li	21	Art	F	4.31	5.13	2.40	2.70	3.03	2.93	4.15	4.45	4.60	5.00	3.58	3.54
Xiang	23	Science	F	4.19	5.13	2.40	2.80	2.67	2.87	4.03	4.18	3.70	4.80	3.54	3.92
Ying	20	Science	F	4.25	4.63	2.50	2.60	2.67	2.60	4.03	4.03	4.60	4.40	3.63	3.96
Chen	20	Science	M	4.06	4.50	2.10	2.80	2.87	2.83	3.82	4.00	4.10	5.30	3.42	3.96

Abbreviations: EI, Emotion Intelligence Scale; ERS, Emotion Regulation Scale; GESE, General Self-Efficacy Scale; M, mean; MAS, Mindful Agency Scale; MCAQ: Meta-Cognition Ability Questionnaire; WPI, Working Preference Inventory.

TABLE 5 Themes and subthemes of qualitative interviews

| Themes	Subthemes
1. Task orientation	Goal clarifying
	Planning
	Time management
	Concentration
2. Motivational management	Using external motivations
	Internalizing motivations
	Cultivating curiosity
3. Openness and acceptance	Self-acceptance
	Non-judging of others
	Non-judging of context
4. Self-awareness and self-regulation	Self-awareness
	Sense of agency
	Cognitive regulation
	Emotion regulation
5. Supports for coaching	Self-monitoring
	Regular reflection and practice
	Collaborative partnership

($p = .17$). The analysis of simple effect over time showed that, with time, the intervention group had significant improvements in MAS ($p < .001$, $t = 4.56$, $d = 1.03$), GSES ($p < .001$, $t = 3.60$, $d = 0.74$), EIS ($p = .02$, $t = 2.38$, $d = 0.40$), and MCAQ ($p = .001$, $t = 3.65$, $d = 0.63$), but no significant improvements in learning motivation ($p = .25$). The control group demonstrated no significant improvements in most measures ($ps > .05$), with a significant decline in EIS ($p = .01$, $t = 2.76$, $d = 0.46$; Figure 3).

6.2 | Qualitative themes

Five main themes with subthemes emerged from the grounded theory analysis (see Table 5). We used participants' responses *in italics* to provide evidence to the themes that were summarized and discussed.

6.2.1 | Task orientation

The participants were coached in goal clarification, planning, time management, and concentration on tasks, and they learned to use the rating strategy that served as the basis for further planning. Most of the participants reported that they developed a stronger sense of time awareness, realized "the meaning of value of different things," the tasks they "should do at this moment," and "[caring] about time allocation." They further stated they would "know the order of doing different things" and even "fulfill the plan in advance intentionally." Regarding the improvement of concentration, several participants mentioned that they used to "compulsively look at mobile phones once every five minutes" and multitask; the mindfulness-based coaching helped them realize the importance of "doing one thing at a time."
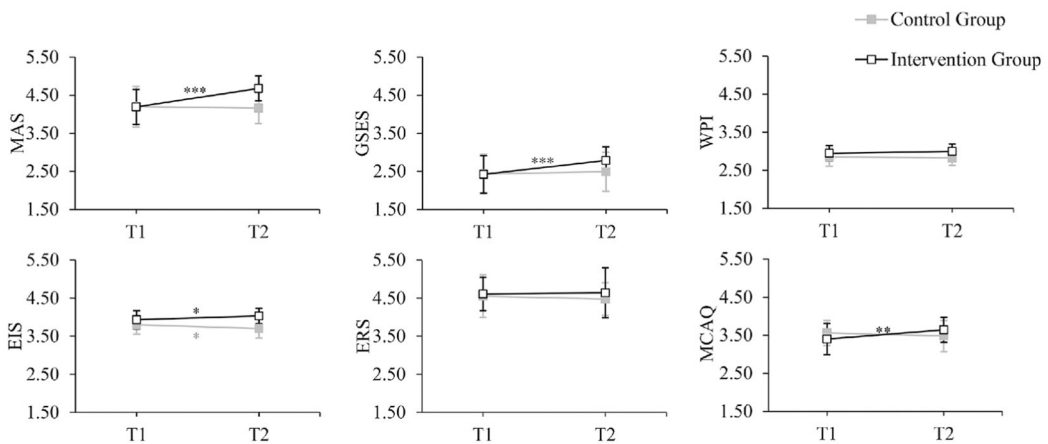
FIGURE 3 Comparisons between pre-assessment (T1) and post-assessment (T2) for the control and intervention groups. EI, Emotion Intelligence Scale; ERS, Emotion Regulation Scale; GESE, General Self-Efficacy Scale; MAS, Mindful Agency Scale; MCAQ: Meta-Cognition Ability Questionnaire; WPI, Working Preference Inventory. Error bars indicate standard deviation. $*p < .05$, $**p < .01$, $***p < .001$

6.2.2 | Motivation management

The participants reported that they commonly experienced fluctuations in academic motivation, and did not know how to deal with it when they did not feel like learning. After coaching, the participants demonstrated three strategic improvements in motivation management: Making better use of external motivation, internalizing motivation, and cultivating a curiosity of learning. The participants reported that they could "find proper external motivation" and sought to "establish a better reward and punishment mechanism" to motivate themselves to learn. MI coaching seemed to work particularly well in helping the participants identify the values of learning and explore their inner "passion for learning." Moreover, MA coaching activities encouraged participants to "notice new things in the current circumstances" and "take new perspectives of familiar things," thereby cultivating a sense of curiosity that stimulated students' appetite to learn.

6.2.3 | Openness and acceptance

One of the most distinctive changes mentioned by the participants was an open, non-judging attitude toward themselves and other people. They constructed positive self-identities by "getting a better understanding of self," exploring core values and personal strengths, and narrating their own stories. One student commented as follows:

> The mindfulness meditation and loving–kindness meditation were useful. When I felt great pressure, the negative feeling came out automatically and I tried to avoid the feeling. Now, I do not try to stop that process. I may experience the negative feeling directly, and notice it—it is just a feeling. I become more focused on the present moment.
>
> (Fang, F, 21)

This accepting attitude extended to interactions with others by mindful listening and collaborative narrative in coaching. The participants learned to "stop and think twice before arguing with others," developed compassion and a deeper understanding of others and became more patient and open instead of making hasty judgments.

6.2.4 | Self-awareness and self-regulation

The interview results revealed that the students improved their self-awareness throughout the coaching. They began to realize their learning conditions, sensations, thoughts, and emotions during academic courses, as one student said: "I am aware of the negative ideas and I give myself some time to calm down." They also became aware of distractive moments, and then brought their attention back to the course: "I realized the proper things I should do and consciously focused on the course." Through enhanced awareness, the participants developed a stronger sense of themselves as active learners rather than passive recipients, with a "higher level of executive ability."

In addition, they enhanced their self-regulatory abilities in the cognitive and emotional aspects. The participants reported that they consciously engaged in "self-enlightenment from different aspects" and assigned a "more positive value" (value modulation) to tasks and objects. They also could "neglect the attractiveness of a game or TV show" and "complete the homework first" (behavioral control modulation). Regarding emotion regulation, some participants indicated that they used to be easily "hijacked by unwanted emotions," and then they would try to escape from the experience or exercise maladaptive defense mechanisms, such as blaming others. These unhelpful strategies would usually lead to negative emotional spirals. Through coaching, most of the participants learned to adopt various mindfulness-based emotion regulation strategies, which helped students become "more at peace" and "separate the negative mood from the self, and re-examine the situation." As such, taking effective and self-determined action could be possible.

6.2.5 | Supporting factors for mindful agency development

The development of positive learning dispositions is a journey, not a race; it could not be completed in a short period only by external coaches. *Self-monitoring, regular reflection and practice,* and *collaborative partnership* were vital to the ongoing development of mindful agency.

The participants found that self-monitoring strategies, such as "record time arrangement" and "setting a daily plan," could help with self-observation and self-reflection. The bi-weekly MA coaching workshops provided the participants with enough time to "put the learned knowledge into practice." Several participants mentioned that the development of mindful agency was "on the basis of effective practice for mindful agency strategies," especially when they experienced "setbacks in daily life." Lastly, they highlighted the importance of collaborative partnerships with peers. With similarities in educational background, academic experience, coaching experience, and some personal characteristics, the participants could share and bond with their friends and classmates. They seemed to develop a preliminary understanding and practice of peer coaching: One regarded another as "a role model from whom we can learn," "a mentor who could sometimes give advice," and "a mirror that reflects ourselves." The mutual influences among students were expected to last after the professional coaches withdrew from the project.

7 | GENERAL DISCUSSION

7.1 | Integration of quantitative and qualitative findings

The current study employed the RCT-embedded mixed-methods design to examine the effectiveness of MACP in enhancing college students' mindful agency and related positive learning dispositions. Results from the quantitative phase revealed that coaching significantly improved students' mindful agency, self-efficacy, learning motivation, emotional intelligence, and meta-cognition. The qualitative phase then identified key learning aspects and supporting factors that were strongly associated with the development of mindful agency.

The statistical results showed significant differences in most of the learning dispositions between the two groups after the intervention, except for the dimension of emotion regulation. We considered that the MACP adopted and integrated appropriate approaches based on established psychological and learning theories. The coaching program involved the positive psychology approach that promoted students' wellbeing, self-acceptance, and social support (Marrero et al., 2016), as well as encouraged them to reflect on their personal strengths and use their existing resources creatively (Marques, Lopez, & Pais-Ribeiro, 2011). The mindfulness-based activities coached students to pay purposeful attention to the present moment without premature judgment and be open to novelty (Littman-Ovadia, Zilcha-Mano, & Langer, 2014). Subsequently, the students developed time awareness and concentration, learned to embrace emotions rather than strive for avoidance, and adopted a friendly, appreciative attitude toward themselves and others. The narrative approach proved to be effective in developing students' positive identities and coping strategies (Kamali & Yoosefi Looyeh, 2013), improving mood states, and changing their sense of self (Corsten, Schimpf, Konradi, Keilmann, & Hardering, 2015). The participants restructured their own learning stories and shared their personal experiences, which was a powerful process that facilitated self-reflection and self-discovery, elicited their intrinsic motivation and hope for future learning, and established empathetic understanding and positive learning relationships with peers. The individual MI coaching evoked a discrepancy between the students' status quo and personal goals (Miller & Rollnick, 2002), enhanced their intrinsic motivation and engagement (Venner & Verney, 2015), and enabled them to change plans as active agents (Britt, Blampied, & Hudson, 2003). During the MI coaching process, the participants were encouraged to focus on their outstanding learning issues, set up reasonable and clear goals, make use of various resources of motivation, and seek effective strategies to reach their goals. Therefore, the MI coaching offered additional support for the participants to develop various learning dispositions.
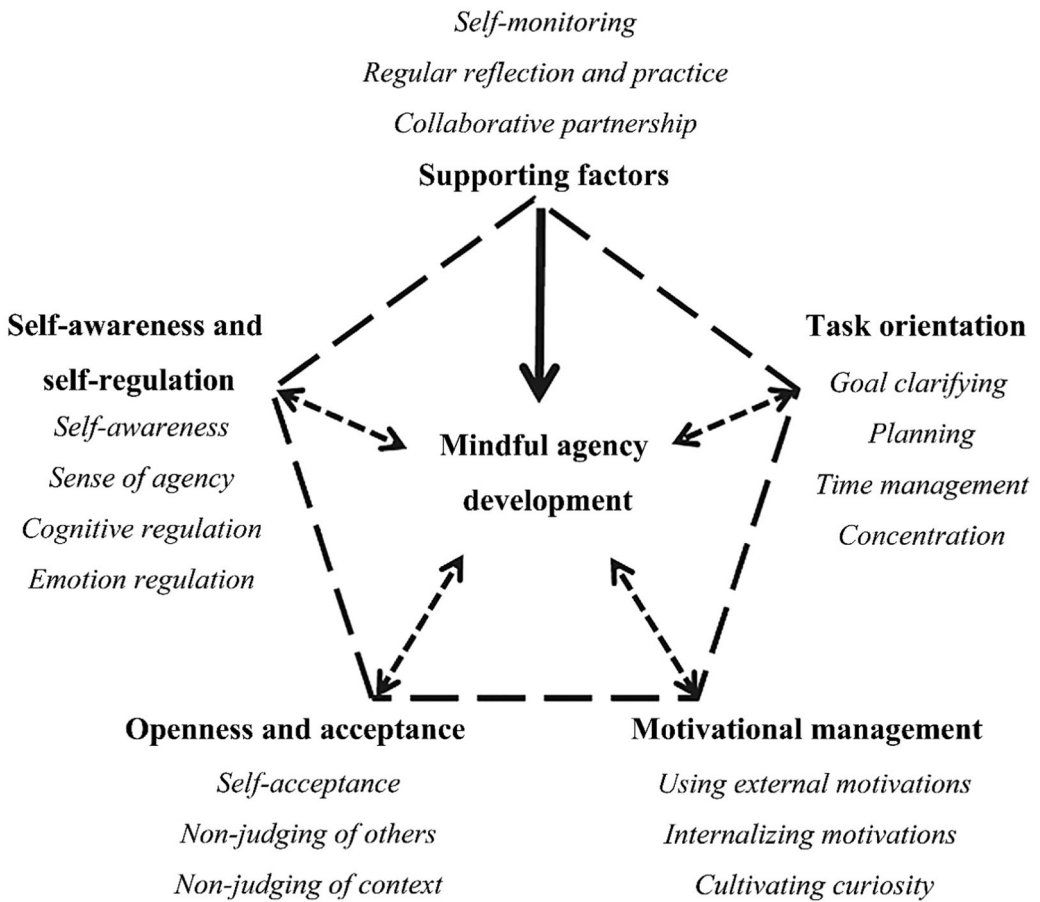
The intervention groups improved significantly in emotional intelligence but not in emotion regulation compared with the control group. This outcome might be due to the participants developing awareness and acceptance of their emotions but not the proficiency in a variety of deliberate emotion regulation strategies (Roberton, Daffern, & Bucks, 2012). To regulate emotion effectively, the students needed further coaching and regular practice on specific emotion regulation skills, which were beyond the current coaching program.

7.2 | Model of mindful agency development

We generated a theoretical model for mindful agency development based on the qualitative findings (see Figure 4). The model indicated that the overall development of mindful agency involved four essential aspects in college students' learning. These four aspects and the five dimensions of mindful agency showed interconnected underlying meanings.

Task orientation, or goal orientation, refers to goal setting and generating action plans, time management and allocation, and concentration during learning. Through coaching, the participants developed a higher level of self-awareness and a deeper understanding of their competence, such that they could build cognitive–affective concepts of self and activate their self-related goal orientations (Kaplan & Maehr, 2007). Motivational management means using proper extrinsic motivation and developing curiosity and intrinsic motivation. As the students' autonomy could predict learning motivation (H.-M. Huang & Liaw, 2007), and it is an essential part of motivation (Ryan & Deci, 2000), our participants became better at balancing extrinsic and intrinsic resources of motivation via a sense of learner's agency. These two aspects showed a close relation to the "agency" side of mindful agency. The other two aspects could be more closely related to the "mindful" side of mindful agency conceptually. Openness and acceptance, along with self-awareness and self-regulation, are essential components of mindfulness (Brown, Ryan, & Creswell, 2007; J. D. Creswell, 2017). Acceptance has been found to positively affect the students' overall level of consciousness and awareness level (Troyer, 2011). Being open to novelty increases one's cognitive flexibility and meta-cognition (Littman-Ovadia et al., 2014). Being accepting toward the self and others facilitates

Self-monitoring

Regular reflection and practice

Collaborative partnership

Supporting factors

Self-awareness and self-regulation

Self-awareness

Sense of agency

Cognitive regulation

Emotion regulation

Mindful agency development

Task orientation

Goal clarifying

Planning

Time management

Concentration

Openness and acceptance

Self-acceptance

Non-judging of others

Non-judging of context

Motivational management

Using external motivations

Internalizing motivations

Cultivating curiosity

FIGURE 4 The theoretical framework of mindful agency development

emotion regulation and cultivation of a soft curiosity and compassionate feelings, which could be useful for establishing learning relationships (Smith-Carrier et al., 2015; van Vliet et al., 2017).

In addition, three factors are considered important for supporting mindful agency development. Self-monitoring involves observing and recording individuals' behavior with the goal of changing them (Axelrod, Zhe, Haugen, & Klein, 2009). It could enhance learning motivation, persistence (Fabriz, Dignath-van Ewijk, Poarch, & Büttner, 2014), and time management (Scheithauer & Kelley, 2017). Reflection is essential for learning and could bridge the theory-practice gap in coaching (Stirling, 2015), especially in self-scheduled practice outside of workshops. Collaborative partnership means two or more students engage in the process of knowledge co-construction, building new skills and competencies, and sharing ideas through mutual support and trust. It is one of the foundations of the peer coaching strategy (Ladyshewsky, 2014). With these supporting factors, the development process of mindful agency could continue systematically.

The model adds to the growing body of literature emphasizing the importance of cultivating positive learning habits and dispositions in college students, taking into account students' own experiences when designing and implementing training or coaching programs. For college administrators and student service officers wishing to implement MACP for students newly entering higher education, this study highlighted the importance of considering students' own strengths, resources, and perceptions, not only of the individual's sense of responsibility and agency in learning but also of the mindful understanding of learning experiences in general.

7.3 | Practical implications

The current study sheds light on the practice of college students' academic and wellbeing support. For example, first-year college students who are moving from high school to higher education are in their emerging adulthood, and their learning engagement is essential for their positive development (Brewer, Nicotera, Veeh, & Laser-Maira, 2018). However, students-in-transition often show insufficient learning engagement and fail to achieve their target GPA (Thibodeaux, Deutsch, Kitsantas, & Winsler, 2017). MACP can be integrated into the orientation and transition programs for first-year college students so that they can be better equipped with learning dispositions. In addition, exam weeks are usually highly stressful periods; students often experience increased worry, distraction, tension, and anxiety (Lotz & Sparfeldt, 2017), as well as decreased wellbeing (Reed et al., 2011). Specific activities in MACP (e.g., mindfulness meditation) could be helpful for stress reduction, self-motivation, self-management, and better decision-making, which would allow students to engage in learning more effectively. For MACP to have a positive effect, colleges need to implement, evaluate, and modify the coaching program according to their own needs.

7.4 | Limitations and future directions

The present study has a number of limitations. First, the sample size in the quantitative phase was small; caution must be taken in generalizing the results. Second, we did not present intervention fidelity data to demonstrate how well MACP was actually implemented, and how well the participants followed the coaching instructions. Future research should include intervention fidelity and social validity data. Third, the quantitative data were collected using self-reported measurements. Further work could collect observations or "360 feedback" from students' peers, teachers, parents, and coaches, and include students' GPA or term reports to examine whether coaching influenced participants' academic performance. Finally, the current study integrated several approaches, such as positive psychology, narrative, mindfulness-based, and MI; it is unclear which approach made the greatest impact on students' learning. Future researchers may be interested in setting different intervention groups to compare the effectiveness of each interventional approach.

CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

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