

The role of mindfulness on the relation between critical thinking and well-being of Chinese EFL learners

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ABSTRACT: Critical thinking has been defined as one of the abilities that Chinese EFL learners require to become skillful in the 21st century. Furthermore, recent investigations have indicated that Positive Psychology (PP) has a pivotal impact on students, and among the related issues of PP, well-being plays a great role in this process. It seems necessary to improve the above factors through teaching strategies which highlight the understanding of the importance of learners' critical thinking and well-being. Among these strategies, mindfulness as one of the language learner's mental characteristics has been revealed to have a positive influence when applied as a management strategy against stress. So, the present study aimed to explore whether mindfulness could play a mediating role in the relationship between critical thinking and well-being. For this purpose, 360 Chinese EFL students were recruited to take part in this study to fill out questionnaires on mindfulness, well-being, and critical thinking. At that point, the structural equation modeling utilizing the pwrSEM program statistical package was used to reveal their possible connections. Results indicated that critical thinking has a positive influence on well-being through mindfulness. Overall, the main role of mindfulness in this field has been identified, and some suggestions have been made based on the present findings.

Keywords: EFL learners, Positive psychology, Critical Thinking, Mindfulness, Well-being

El papel de la atención plena en la relación del pensamiento crítico y felicidad entre los estudiantes chinos de ILE

RESUMEN: El pensamiento crítico se define como una de las habilidades esenciales para los estudiantes chinos de inglés en el siglo XXI. La psicología positiva tiene un impacto significativo en los estudiantes, y felicidad es importante en temas relacionados. Parece necesario mejorar estos factores con algunas estrategias de enseñanza que enfatizan la comprensión de la importancia del pensamiento crítico y el bienestar de los estudiantes. La atención plena, como una de las características psicológicas de los estudiantes de idiomas, tiene un impacto positivo cuando se utiliza como una estrategia de gestión para hacer frente al estrés. El objetivo de este estudio es explorar si la atención plena puede desempeñar un papel intermedias entre el pensamiento crítico y felicidad. Para ello, 360 estudiantes chinos de inglés participaron en el estudio, completando cuestionarios sobre la atención plena, felicidad y el pensamiento crítico. Los modelos de ecuaciones estructurales de paquetes estadísticos utilizando el programa pwrSEM se utilizan para revelar posibles vínculos entre ellos. Los resultados muestran que el pensamiento crítico tiene un impacto positivo en la felicidad a través de la atención plena. Resumiendo, se ha identificado el papel principal de la atención plena en este campo, y se han hecho algunas recomendaciones.

Palabras clave: estudiantes de inglés, psicología positiva, pensamiento crítico, atención plena, felicidad

1. INTRODUCTION

Critical Thinking (CT) is broadly deemed as an essential higher-order cognitive process that is associated with the capability of analyzing and assessing evidence and arguments with unbiased judgments from previous experience and knowledge (Lau & Chan, 2015). Based on Evans and Stanovich (2013), such an automatic reflection involves the activation of an Executive Function (EF) – observing, improving, and diverting between representations in dynamic memory – and engages the deliberative processes. The improvement of CT in educational settings has proved to be crucial and pivotal (Radulovic & Stancic, 2017). As pointed out by Elftahi (2017), CT makes it possible for people to more effectively encounter various challenges (e.g., personal, career, academic, etc.). Undoubtedly, CT can be essential in all areas (Changwong et al., 2018; Santos, 2017). However, its usefulness is very significant in contexts where the language is applied to interact ideas as in their use of the target language; people are not just combining different constituent parts of speech but conveying their thinking, as well. CT is significant for people in helping them to become great because with these abilities they can determine problems in a complicated situation, evaluate and advocate for a complicated situation, think outside the limits most of the time, and bring up the viewing trigger points (Salleh et al., 2017; Wang & Guan, 2020).

The other important concept is the well-being of learners which plays an essential role in the academic setting, contributing to enhancing learning and also expanding students' beliefs towards the challenges encountered (Derakhshan, 2022; Derakhshan et al., 2023a; Fan & Wang, 2022; Li, 2021; Wang et al., 2022). This is realized by motivating learners and staff to act at the highest level physically, emotionally, and mentally (Derakhshan, Solhi, et al., 2023a; Seldon & Martin, 2017). According to Lucas and Rodgers (2016), a college degree is aimed at preparing learners to be involved and responsible citizens and it also equips them with techniques and skills to live a better life with perceived goals and meaning. Improving and fostering learners' well-being leads to an expanded likelihood of graduation and positively impacts their mental and emotional health (Derakhshan, Wang, et al., 2023b; Wang et al., 2021). Colleges and universities' commitment to well-being is a developing consideration of psychological health in colleges. The role of consciousness in the maintenance and improvement of well-being has been reiterated by researchers working in the fields of philosophy, spiritual science, and psychology (Derakhshan, 2022; Fan & Wang, 2022).

Moreover, educators have been increasingly interested in investigating the employment of methods based on mindfulness in foreign language acquisition and teaching recently. By these methods, they tend to decrease stress, improve and promote the atmosphere of the class, and contribute learners to concentrating on their attention and thinking more apparently (Zafari & Khademi Eshkezari, 2020). One of the main methods related to consciousness that can also contribute to well-being is mindfulness practice which has been extensively discussed by some scholars (Siegel, 2007; Zylowska et al., 2008). Over the last 15 years, the advantages associated with mindfulness practice have been the focus of attention as the previous

literature associated with PP shows mindfulness as another dimension that has proved to be advantageous to well-being (Wang & Liu, 2016; Wang et al., 2021). It has also aroused growing attention across different academic and clinical fields. Mindfulness is defined as the manner of being informed of what a person is experiencing (Li, 2021; Wang & Liu, 2016). Mindfulness practices have been increasingly finding their way into the classroom of foreign languages as they are advantageous for the acquisition of a second language (Moafian et al., 2019). This is because mindfulness emphasizes innovation, creativity, participation, presence, flexibility, the important role of learners, and sensitivity (Li, 2022).

Based on the literature, according to some scholars (Mercer, 2021; Wang et al., 2021), in the realm of L2 education, prioritizing the well-being of students plays a critical role in language instruction and acquisition. PP tackles human problems and challenges by focusing on the strengths of individuals, rather than their weaknesses, while keeping a keen eye on their well-being (Derakhshan, 2022; Wang & Guan, 2020). Positive student well-being fosters constructive pupil attitudes toward the complicated situations they faced. CT abilities and constructive mental well-being are vital to learners in helping them to be successful (Whiley et al., 2017). The connection between well-being and CT is well made on one hand (Facione & Gittens, 2016; Whiley et al., 2017), and on the other hand, the role of mindfulness in developing learners' self-efficacy, and achievement is assured based on PP principles (Baer & Lykins, 2011). However, little is determined about whether mindfulness works as an intermediary among EFL pupils. Therefore, given the significance of these two conceptions, such as CT and well-being, this investigation was carried out to explore the effectiveness of mindfulness as a moderator on these two elements. Therefore, the subsequent research questions were generated:

RQ 1: How do well-being, CT, and mindfulness correlate among Chinese EFL learners?

RQ 2: What role does mindfulness play in the interrelatedness of well-being and CT?

2. REVIEW OF THE LITERATURE

2.1. Critical Thinking

CT skills are described as a logical, purposeful thinking approach and they are characterized by Mason (2007) as a doubtful or skeptical approach used for making decisions, gaining mastery over concepts, and solving problems. Individuals with a high level of CT show behavioral dispositions which are needed and acknowledged in both academic and vocational settings. Additionally, CT refers to the ability to think clearly and rationally about what to do or what to believe. It includes the ability to engage in reflexive and independent reflection (Lau & Chan, 2015). Indeed, CT involves a process of questioning fixed ideas and is a means of assessing whether a statement is true, false, or partially true. TC is regarded to be self-disciplined, self-directed thinking that explores to use of reasoning at the greatest quality equitably (Mathews & Lowe, 2011). It is evident that CT skill is not developed spontaneously; rather, instructors need to pave the way for the enhancement of CT among the learners. As far as L2 classes are involved, teachers can use CT as a medium which can increase the richness of interactive material and approaches. Moreover, CT is deemed as a

tool through which learners are helped to obtain and appreciate the content in a deep and meaningful way that can be grasped through questioning (Paul & Elder, 2006). It can be proposed that mindfulness assists students to make a better practice of the aptitude to ask questions by participating in the instant of learning or problem-solving (Chalmeh et al., 2022).

2.2. Well-being

The concept of well-being, as a main term of PP (Derakhshan, 2022; Fan & Wang, 2022; Wang et al., 2021; Wang et al., 2022) refers to the individual's mental experience of good health, constructive emotions, positivity, prosperity, and happiness (Derakhshan et al., 2022; Khajavy et al., 2021; MacIntyre et al., 2019). It has a positive effect on people's lives by bringing about life contentment and the ability to mitigate and manage stress. One can define well-being from two points of view, namely, hedonic or eudemonic (Ryan & Deci, 2020). The hedonic perspective only focuses on pleasure and life enjoyment, characterizing well-being as having happiness and avoiding agony. On the other hand, the eudemonic perspective on well-being emphasizes self-actualization and is concerned with the essence of people's lives and the accomplishments of their skills. Such an approach advocates for the foundation of psychological well-being, benefiting from these capabilities to use assets to mean enhancement in life (Mercer & Gregersen, 2020).

As implied in the term 'flourish', a perspective on well-being is concerned with happiness and delight, as well as the perceived meaningful participation and ethical value (Seligman, 2011). The frameworks of PERMA encompass the components of well-being. These frameworks have been used both as a driving force for practically measuring and empirically investigating the notion of well-being. For instance, Seligman's (2011) PERMA framework is composed of constructive feelings, active involvement, constructive connections, meaning, and achievements. Involvement has to do with participation in the interactions which leads to motivation purely via task completion, solid specification, observing, and obtaining high well-being during life (Derakhshan, 2021). Positive communication is concerned with one's perceptions of being accepted, heeded, and supported in social terms. It also involves relishing an individual's interaction in society. Social assistance has to do with the constructive findings of mental and bodily well-being, as well as well-being generally (Greenier et al., 2021). As well-being refers to enjoying a good life and is strongly linked with the concept of quality of life and satisfaction, the role of mindfulness is significant as it improves self-regulation, bringing about more satisfaction of the essential psychological needs and accordingly, wellness (Ryan & Deci, 2020).

2.3. Mindfulness

Mindfulness is described as a favorable state experienced by L2 learners (Noone et al., 2016b). It was initially the psychologist, Ellen Langer who proposed and developed the notion of mindfulness, although it originates in Eastern philosophy. Literature has given several definitions of mindfulness. For example, based on a definition, mindfulness has to do with being completely aware of the moment and others. It involves being aware of one's physical, psychological, and communal experiences, as well as internal states, feelings,

mental conditions, and ideas while admitting them all frankly (Taylor et al., 2016). Indeed, the full awareness of ongoing unbiased experiences and mental states is deemed as the main presumption in the discussions on mindfulness.

According to Baer et al., (2006), mindfulness is now deemed as a learning model, which attaches great importance to the following abilities of learners: the power of observing: the capability of observing and being aware of senses, beliefs, emotions, understandings, and sensations; the capability to define: the capability of elaborating in words; behaving with awareness: non-reactivity: non-reactive views of personal experience, and non-judge: non-judgmental attitude and perceptions with no assessment of personal experience (Baer et al., 2006). These qualities can motivate the learners to improve their CT, self-reflecting on their acquisition, and put their acquisition to use (Teper & Inzlicht, 2013; Wang & Liu, 2016). Moreover, mindful acquisition enables the learners to focus and feel motivated during the process of acquisition and teaching (Tuyan & Kabadayi, 2018) which in turns affect well-being.

2.4. Related Studies

In their meta-analysis, they indicated a significant advancement in intellectual achievement, which showed that mindfulness can enhance attention and cognitive functioning that helps individuals to process thoughts. Noone et al. (2016b) also establish a correlation between CT and mindfulness by pointing out the contributions of mindfulness to CT in greater education since CT is a crucial “higher-order cognitive process” containing examining facts and discussions. Furthermore, the results of the study done on 295 Iranian university learners by Fallah (2017) indicated that greater levels of mindfulness were related to decreased levels of anxiety about foreign languages and even enhanced self-efficacy and mindfulness intercessions were not performed in either study, as both concentrated on predisposed mindfulness. In addition, the ability to replicate self-efficacy in mediating the interaction between mindfulness and anxiousness was examined. The findings of the SEM analysis revealed that higher levels of mindfulness were similar to lower anxiety levels and higher transcriptional efficiency. Further, it was recognized that self-efficacy might partially mediate the association between mindfulness and the acquisition of a foreign language. In addition, the ability to replicate self-efficacy in mediating the interaction between mindfulness and anxiousness was examined. The findings of the structural equation modeling (SEM) analysis revealed that higher levels of mindfulness were similar to lower anxiousness levels and higher transcriptional efficiency. Further, it was recognized that self-efficacy might partially mediate the association between mindfulness and the acquisition of a foreign language.

According to the study conducted by Su and Shum (2019), there exists a correlation between mindfulness traits, CT, misperception, and psychological distress. The sample included 287 learners in Hong Kong and the findings indicated that high CT was significantly related to high levels of psychological distress as their consciousness levels were low. Mindfulness trait was found to balance the indirect effects of CT on psychological distress through cognitive distortions as a mediator. Particularly, under low-characteristic mindfulness conditions, CT was found to be constructively associated with cognitive distortions and mental distress. Such corporations were not detected in the high-characteristic mindfulness condition.

Moreover, Zeilhofer (2022) studied the impact of meditation exercises on academic actions and levels of mindfulness. In this study, 75 first-year Japanese learners participated, and they were separated into two experimental groups for two courses, one to meditate by the approach of breathing and the other to receive guided meditation. In comparison with the non-meditation control group, both experimental groups had remarkably better scores and expanded mindfulness. Asadi et al. (2021) have done a study among learners of Kharazmi University. The participants involved 240 female and male learners who were designated by the convenience sampling method. The students filled out the questionnaires, and the results of the study showed that although there is not any difference between students regarding mindfulness and psychological well-being across gender, the relationship between psychological well-being and the total mark of mindfulness is significant. In addition, Wen et al. (2021) have studied the role of mindfulness on primary school learners' anxiety and apprehension in China. Chalmeh et al. (2022) explored the mindfulness role as a mediator in the connection between a supportive setting for autonomy and CT. The participants of this inquiry consisted of all high school students of Shiraz. The selected ones totaled 525 and they responded to three questions: The Scale of Autonomy Support Environment, the Mindfulness Questionnaire of Freiburg, and the Test of CT. The results suggest that although CT has a constructive association with cognitive actioning, its relatedness with emotional well-being may be negative. The findings also propose that mindfulness may play a significant role in preventing probable mental distress related to CT. According to the literature review and existing studies in this domain, the current study is aimed at bridging this gap by investigating the possible role of mindfulness in the relationship between EFL students' CT and well-being.

3. METHOD

3.1. Participants

A total of 169 male and 191 female Chinese EFL learners at different state universities participated in this inquiry. They are BA and MA students and their ages ranged from 20 to 37. All participants expressed their agreement and completed an online questionnaire program. The undergraduate programs offered to all the BA participants are 4-year full-time studies while the graduate programs to all the MA participants are 2 or 3.

3.2. Instruments

The subsequent instruments are used in the current study, including the Mindfulness Questionnaire (FFMQ), the California Critical Thinking Disposition Inventory (CCTDI), and the PERMA well-being scale, all of which are among the most used questionnaires in the language context.

3.2.1. Mindfulness Questionnaire (FFMQ)

Bohlmeijer et al. (2011) developed a short kind of Five-dimensional Questionnaire on Mindfulness. The scale was a survey with 24 validated elements that required to rate how

true each statement is to them, and the elements were scored on a 5-point Likert scale (1 = “never or very rarely true” and 5= “very often or always”).

3.2.2. *The California Critical Thinking Disposition Inventory (CCTDI)*

Facione and Gittens (2016), associated a questionnaire including 75 statement items that were employed as the basic mean to investigate the directional dimensions of CT. Six-point Likert-type scale which ranges from 1 to 7(Strongly Disagree to Strongly Agree) is applied to record the elements.

3.2.3. *PERMA Well-being scale*

The investigator employed the PERMA scale developed by Butler and Kern (2016) to assess Martin Seligman’s conception of five dimensions of well-being, consisting of 15 items, 3 items in each aspect. PERMA-Profiler sub-ranges have proven to be reliable and valid (Butler & Kern, 2016).

3.3. The Procedure of Data Collection

To meet the goals of this study, through distributing questionnaires through an online program, called Questionnaire Star (Wenjuanxing), a well-known data collection software in China, the data was well-gathered during the 2022 last months. A total of 360 valid questionnaire rates were collected from EFL learners from universities in Beijing and 3 universities in Tianjin of China. To expand the sample’s reliability and validity, the participants were informed of how to correctly complete the questionnaire and give valid answers. They were also notified of their right to withdraw from the questionnaire if they felt uncomfortable during the process. There was no contradiction between the investigators and participants. After that, the gathered data was thoroughly checked for possible errors and restrictions before being evaluated.

3.4. The Analysis of Data

To respond to the research questions of the inquiry, Mplus 8.4 (Muthen et al., 2017) was used for the analyses. To deal with the non-normality of the observations, a maximum likelihood estimator with a robust standard error was adopted (Muthen et al., 2017). To assess the power of the regression paths in this SEM model, we utilized the pwrSEM program on Shiny (Wang & Rhemtulla, 2021), which relies on Monte Carlo simulation with 10,000 iterations.

4. RESULTS

The factor loadings of subfactors of CCTDI, PERMA, and FFMQ were adjusted from .51 to .77, to represent the scale’s overall reliability according to the previous investigations (e.g., Albert et al., 2002; Lan & Saad, 2020; Noone et al., 2016b). When residual covariances

for all sub-factors of CCTDI, PERMA, and FFMQ scales were fixed at .30, the results show that with 360 sizes of sample and 0.05 alpha level, the examination admits at least a 90% chance of determining the load factor.

- **Model 1:** Unidimensional CFA Model of global CCTDI, PERMA and FFMQ
- **Model 2:** Correlated First-Order CFA Model including subfactors of each construct of CCTDI, PERMA, and FFMQ

To select the most suitable model for the measurement model, the relevance index was considered to discriminate between several models. We used goodness of fit measures including the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), root mean square error of approximation (RMSEA), and standardized root means square residual to evaluate the model fit criterion (SRMR). SEM was chosen as the approach to analyze the data over multiple regression or simple correlations since it allowed for variable latent modeling while accounting for measurement error (Ullman & Bentler, 2003). As a result, the constructs may be studied precisely, with unbiased estimates, offering a clearer view of the linkages between constructs (Ullman & Bentler, 2003).

4.1 Preliminary Analyses

Construct Validity of the research scales

Firstly, the measurement models were assessed for construct validity using CFA. Table 1 displays the outcomes of the CFAs.

Table 1. *Model fit indices of the three variables*

Model	χ^2	df	p	CFI	TLI	SRMR	RMSEA
FLP scale							
Unidimensional CFA	184.341	29	.000	.889	.875	.058	.073
First-Order CFA	114.954	28	.000	.926	.903	.040	.067
CBS scale							
Unidimensional CFA	165.218	36	.000	.892	.877	.058	.073
First-Order CFA	90.527	33	.000	.936	.912	.040	.067
SEQ							
Unidimensional CFA	196.863	40	.000	.906	.897	.058	.073
First-Order CFA	124.509	39	.000	.931	.915	.040	.067

As shown in Table 1, the results revealed that unidimensional CFA models of CCTDI, PERMA, and FFMQ could not effectively match the data. The first-order structure model with five specialized components (analysis, inference, evaluation, inductive reasoning, and

deductive reasoning) was proven to be the best model fit for CCTDI. All factor loadings were significant ($\lambda > .35$) and ranged from .46 to .64.

Table 2 contains detailed information on the factor and item levels' reliabilities and validities for the r CFA models of CCTDI, PERMA, and FFMQ. The reliability coefficients for all constructs and their sub-factors were more than .70 and hence acceptable. The measurement models were also evaluated to determine the item validity for each latent component, suggesting that each construct had acceptable innate consistency (see Table 2).

Table 2. Descriptive statistics, reliabilities and validity for CCTDI, PERMA and FFMQ scales

	Mean	SD	α	ω	AVE
CCTDI	5.832	2.354	.881	.891	.644
1. Analysis	5.345	2.151	.725	.732	.513
2. Inference	6.184	2.468	.743	.759	.532
3. Evaluation	4.879	1.753	.778	.798	.612
4. Inductive reasoning	4.563	1.974	.757	.773	.588
5. Deductive reasoning	4.651	2.018	.732	.754	.543
PERMA	3.047	1.589	.851	.879	.669
1. Positive emotion	6.127	2.025	.808	.827	.611
2. Engagement	6.52	1.221	.872	.886	.647
3. Relationship	5.245	1.386	.902	.915	.685
4. Meaning	6.951	1.574	.855	.873	.672
5. Accomplishment	6.274	2.647	.877	.898	.593
FFMQ	11.744	2.234	.791	.809	.658
1. Observing	10.532	2.653	.775	.797	.585
2. Describing	13.238	2.328	.709	.721	.543
3. Acting with awareness	10.987	1.665	.753	.775	.582
4. Non-judging	10.532	2.128	.734	.758	.528
5. Non-reactivity	12.841	2.087	.726	.746	.536

4.2 The Influence of CT on Well-being

Table 3 contains the Pearson correlation coefficient matrix for all variables included in the model. The findings revealed that CCTDI, PERMA, and FFMQ were all intimately related. More specifically, CT and its subfactors were shown to be positively related to well-being and its subfactors, as well as mindfulness and its subfactors.

Table 3. Correlation matrix for CCTDI, PERMA, and FFMQ

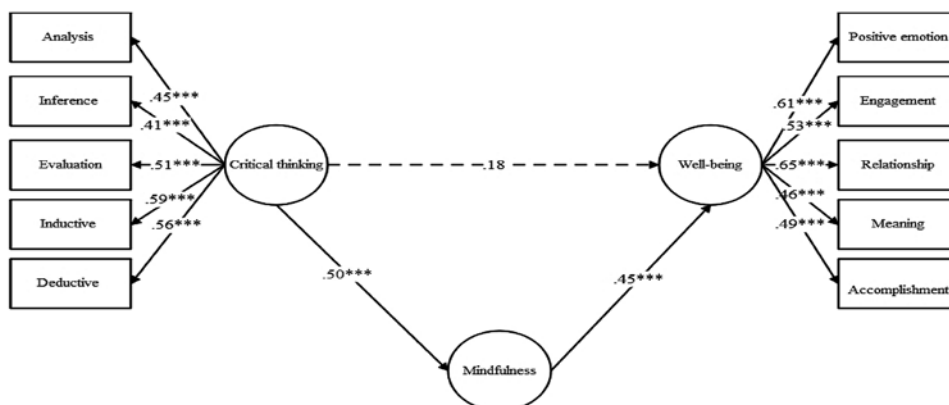
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1.Critical thinking	-																		
2.Analysis	.46	-																	
3.Inference	.42	.25	-																
4. Evaluation	.53	.23	.42	-															
5.Inductive	.61	.23	.43	.80	-														
6.Deductive	.57	.45	.55	.51	.33	-													
7.Well-being	.46	.36	.31	.33	.37	.38	-												
8.Positive emotion	.38	.31	.29	.38	.34	.39	.64	-											
9. Engagement	.32	.35	.34	.32	.35	.27	.56	.43	-										
10. Relationship	.31	.28	.29	.35	.38	.36	.65	.43	.40	-									
11. Meaning	.45	.42	.31	.40	.40	.35	.48	.44	.45	.46	-								
12.Accomplishment	.43	.19	.35	.24	.32	.39	.51	.50	.41	.40	.41	-							
13. Mindfulness	.45	.32	.44	.40	.28	.36	.45	.38	.40	.27	.36	.34	-						
14. Observing	.44	.38	.41	.35	.48	.39	.37	.38	.32	.28	.34	.37	.47	-					
15. Describing	.48	.41	.50	.37	.32	.39	.28	.41	.43	.39	.41	.36	.60	.25	-				
16. Acting	.32	.32	.29	.35	.36	.27	.41	.36	.42	.47	.33	.32	.54	.27	.47	-			
17. Non-judging	.47	.41	.36	.34	.44	.42	.44	.32	.46	.33	.28	.34	.61	.20	.29	.44	-		
18. Non-reactivity	.28	.23	.30	.24	.26	.30	.48	.30	.45	.37	.41	.46	.43	.33	.48	.38	.32	-	

The direct influence of the predictor (*CT*) on the dependent variable (*well-being*) without considering mediators (*mindfulness*) was evaluated. This finding revealed that the fit indices of the partial and total reconciliation models turned out to be satisfactory. In addition, a statistical competence analysis was performed for the consequence size. It was 0.98, which is very high in Cohen’s (1988) suggestion applied. The significance of the partial intermediate model was assessed by employing the bootstrap assessment method (a bootstrap sample of 10,000 was specified). The findings were indicated in Table 4.

Table 4. Path estimates of structural models

	Direct effects model			Full mediation model			Partial mediation model		
	β	SE	R ²	β	SE	Effect size	β	SE	Effect size
CT→ Mindfulness	-			.473***	.011	.282	.501***	.007	.385
Mindfulness →Well-being	-			.337***	.008	.231	.453***	.003	.343
CT→Mindfulness →Well-being	-			.198***	.005	.196	.227***	.002	.276

The results confirmed that mindfulness positively and directly affected well-being ($\beta = .453$; $p < .001$). Finally, the result confirmed that CT positively influenced well-being through mindfulness ($\beta = .227$; $p < .001$).



***: $p < .001$.

Figure 1. Structural equation modeling results

5. DISCUSSION

The goal of this study was to inspect if CT positively influenced well-being through mindfulness. The findings of the analysis revealed that mindfulness had a constructive and important direct impact on well-being and CT. This is in line with the findings from other investigations that revealed a possible link between CT and meditation. Noone and Hogan (2016) note that due to mindfulness, a form of meditation needs inner awareness of an individual's experience, exercise can also develop CT that needs inner questioning of attitudes and logic. The results also support those of Asadi et al. (2021) who found a relationship between psychological well-being and the total mark of mindfulness. Indeed, in the realm of education, the more attentive students are, the more they will pay attention to their everyday experiences, the more preoccupied they are with what they are doing, the more they see a promotion in their activities, and possibly the most impactful decision they will make in their academic life (Shapiro et al., 2008).

Moreover, mindfulness prepares a positive perspective for learners in their acquisition process, encourages them to engage in productive and reflective learning, and develops self-efficacy, life satisfaction, and excitement (Fallah, 2017). The result also confirmed that mindfulness positively and directly affected well-being. The literature has consented that mindfulness exercises are a significant means for improving psychological health and the development of mental well-being (Fan & Wang, 2022; Fu & Wang, 2022). The result is justifiable as Mindfulness is an important dimension of well-being. Mindfulness involves being aware of present-moment experiences such as thoughts, bodily sensations, and environment (non-judgmental). Mindful awareness contradicts the default condition of daily life, in which the state of awareness for many people is intrinsic since the mind can wander or function without thinking (Xu et al., 2022).

Theoretically, the self-determination theory (SDT) accounts suggest that well-being is developed by mindfulness through enabling higher manner independent control, thereby being linked to a greater level of consistency and fewer issues while performing, greater

attainment, and lower level of tension (Shannon et al., 2020). Theoretically, the SDT to some extent predicts that independence will balance the link between well-being and mindfulness findings. Additionally, the result confirmed that CT positively influenced well-being through mindfulness. This finding is also in the same line with previous ones (Chalmeh et al., 2022; Noone & Hogan, 2016a; Su & Shum, 2019). Noone and Hogan (2016a) indicated that mindfulness can positively anticipate CT as mindfulness meditation decrease anxiety in learners which lessened their executive functioning, and ultimately their CT. Škopalj (2018) also pointed out that mindfulness can have an essential role in student development and the employment of CT. To clarify this result, it can be noted that mindfulness skills assist students in better utilizing their skills to ask questions about situations by paying attention to learning moments and problem-solving. The advantages of mindfulness can be recognized in the other features of learners' lives with better skills in focus, problem-solving, impulse control, rapport-building, and stress reduction. The objective of mindfulness education is not to make students seek out desirable emotions and abstain from unpleasant ones. Mindfulness is the substructure for deep observation and comprehension of conditions that are crucial for the happening of a specific phenomenon that is attended in CT about the topic (Škopalj, 2018). The results of the present study are similar to what was found by Asadi et al. (2021) in which the relationship between mindfulness and well-being was reported as significant. Considering CT, Noone et al. (2016) reported a similar finding to ours indicating the contribution of mindfulness to CT which resembles Su and Shum (2019) in which the indirect effect of mindfulness on CT was reported. Our findings also lend support to Chalmeh et al. (2022) which proposed the mindfulness role significant in preventing probable mental distress related to CT.

6. CONCLUSION, IMPLICATIONS, AND FUTURE DIRECTION

The results of the present paper suggest that taking the mindfulness level into account, CT can result in cognitive promotion, which in turn leads to mental well-being. From a pedagogical perspective, CT abilities are necessary abilities to teach learners. Enhancing the advantages of CT on cognitive performance is the key here so that one can see that mindfulness aids people who think critically regarding their mental well-being. As stated by Shapiro et al., (2008), mindfulness plays a significant role in improving both cognitive and academic processes (e.g., the span of attention and concentration), mitigating the stress related to academic settings, and the development of the "whole person". It is discussed that perhaps teaching based on mindfulness should become an essential element in learners' social-emotional abilities for their enhancement in schools and can be used to develop learners' general well-being. According to Ryan and Deci (2017), mindfulness has been linked with promoting conscious and self-motivated control of behavior and has been recognized for its positive impact on overall well-being. Mindfulness may be significant in separating a person from automatic unhealthy manners patterns and consequently have a vital power in nurturing regulation, which has been related to well-being development (Ryan & Deci, 2020).

Furthermore, it can be concluded that conducting exercises of mindfulness and being aware of the present moment and what we are doing, and employing activities according to a social-cognitive method of mindfulness can lead to enhancement in students' CT. Thus, the

findings confirm that instructors should request their learners to pay attention to the lesson to solve their issues. Mindfulness can make an important contribution to individuals' ability to distance themselves from habitual thoughts, behaviors, and unhealthy behavior patterns; therefore, it can be essential in enhancing informed and self-endorsed behavioral regulation, which has proved to be related to increased well-being (Ryan & Deci, 2020). Additionally, well-being is improved by increasing an accurate sense of an individual's current experience and permitting an individual to come into a relationship with life with "no dense filtering of the experience by discriminating thinking" (Brown et al., 2007).

Universities and colleges that suggest trainee teachers have more chances to learn and exercise mindfulness in devoted courses should do so with trained, experienced mindfulness teachers applying mindfulness first-rate programming because the concept is the mediator in the relation between CT and well-being. The available evidence suggests that practicing mindfulness can improve students' positive feelings, enabling them to enjoy their educational experience by adopting a more positive outlook toward the learning process (Schonert-Reichl & Lawlor, 2010). According to their statement, teaching mindfulness enables students to reduce pressure, stress, and over-thinking while improving their overall health and academic self-assurance. By practicing mindfulness in schools, teachers can efficiently manage their time and improve students' awareness of the present moment, leading to increased concentration and attention. Developed mindfulness training in education also presents an opportunity to enhance great well-being programs, particularly for teacher training, providing teachers with meditation employment in the class. Significantly, mindfulness also blends well with existing approaches classes on subject teaching methods, proposing instructional design work to contribute to teachers integrating mindfulness into the content of classrooms. A strong correlation has been found between increased levels of mindfulness and decreased levels of negative emotions such as sadness, stress, and anxiety. Based on the findings of the research conducted by Masuda and Tully (2012), this, in turn, leads to a higher level of well-being which includes reduced feelings of anxiety and an improved ability to use effective coping mechanisms. By encouraging focus on tasks and approaching them with creative inquiry, mindfulness has the potential to positively impact critical thinking. Studies have indicated how mindfulness in subject acquisition can assist learners to learn the content more meaningfully and also enhance self-regulation in the process of acquisition (Davenport & Pagnini, 2016). The results can be beneficial for EFL students, as they can look for chances to improve their CT, rely more on their acquisition abilities, and motivate themselves by thinking about the constructive advantages of foreign language learning. These results could be useful for programs designed for EFL teachers to consist of targeted courses to develop competent learners and capable critical thinkers. Teachers, specifically EFL teachers, are suggested to integrate and enhance these mindfulness-related skills into the context of the classroom through processes with CT promoters. Also, educators can be encouraged to prioritize mindfulness as a vital factor in coping with stress and exhaustion by informing them of the benefits of emotional consciousness leading to improved well-being.

Furthermore, the results are significant for those who know the significance of CT in the process of EFL courses as CT is very critical for learners with these abilities they can determine problems/issues in a complicated setting and can evaluate and justify the situation, can think outside the limits most of the time and bring up the viewing trigger points, and

are capable to decide according to solid, real, and traceable evidence (Facione, & Gittens, 2016; Whiley et al., 2017). Likewise, introducing mindfulness instruction as an intervention can potentially enhance students' dedication to their studies and improve their performance in English learning environments. Specifically, their skill to perceive challenging situations without instantly reflecting on them is possibly related to higher well-being like the PsyCap foundation. Moreover, instructors, curriculum designers, and syllabus developers should cover mindfulness abilities in their classes, textbooks, and materials. Incorporating these abilities into textbooks leads to educated learners who have great levels of well-being and great CT skills.

Due to the lack of research in the domain of mindfulness structure, the current study attempts to shed light on understanding how mindfulness is applied as a means to modify and keep constructive experiences. The findings of the current discovery have important suggestions for those attentive to conceiving interventions encompassing the specific goal of enhancing mindfulness for CT enhancement and learners' well-being. The objective of this study was simply for EFL students. Although, regarding the scarcity of investigations in other fields, it is desirable to investigate further in the field of education to explore the links between several issues in favor of learning at different levels of learning English as a foreign language, in private institutions, and even among English educationalists. In addition, only undergraduate and graduate learners were included in this study so it would be valuable to include those from diverse age ranges. More study is proposed to examine concordance among variables searched in this study related to learner achievement. Furthermore, in the present study, the investigator quantitatively examined the association between structures. Both qualitative and quantitative approaches are employed for the survey to be more accurate. Choosing some other approaches, particularly observational or qualitative methods, can provide an overview of mindfulness's mediating role. While the current study discovered the impact of mindfulness, there is still uncertainty surrounding its natural enhancement and the mental and societal factors that encourage or impede its consistent state and momentary manifestation.

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