

Research Article

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Author for correspondence:

Amjad Alrekebat
✉ amjad.f.alrkibat@ahu.edu.jo
✉ Faculty of Educational Sciences, Al-Hussein Bin Talal University, Jordan



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The Impact of a Training Program Based on the Cognitive Apprenticeship Model on Improving Mindfulness among Eighth Grade Students

Sami Aljazi , Amjad Alrekebat , Murad Al-Bustanji 

Abstract

Background/purpose. This study investigated the impact of a training program based on the cognitive apprenticeship model on mindfulness among eighth-grade students in Jordan. The study addresses the need for evidence-based interventions that foster students' cognitive and emotional development in educational settings.

Materials/methods. The sample comprised 80 male and female students, purposively selected and divided equally into two groups (experimental and control). Both groups underwent a mindfulness scale as a pre-test and post-test. A training program was developed and implemented for the experimental group, consisting of 17 sessions over eight weeks.

Results. The results of the analysis of (ANCOVA) showed statistically significant differences between the mean scores of the two groups in mindfulness after the application, in favor of the experimental group, with a high effect size ($\eta^2 = 0.194$), indicating the effectiveness of the program. The results also showed statistically significant gender differences favoring males, which can be explained by social factors that encourage males to adopt traits such as independence and emotional control, which may indirectly contribute to the development of mindfulness skills.

Conclusion. The study recommends applying the program to other academic stages and expanding the study of its impact on various cognitive and affective variables.

1. Introduction

Over the past decade, the topic of mindfulness has been the subject of growing research, as scientists and practitioners have sought to optimize this ability and understand the impact of external and behavioral factors on it in the context of the accelerated pace of life and increasing daily problems. Research has shown that mindfulness is associated with increased attention and emotion regulation in learning settings (Allen et al., 2021). Mindfulness has been defined as the ability to focus heavily on tasks, manage attention and emotions, and think effectively. It is a state of total awareness of the present time without distraction or judgment (Bherer et al., 2013). Mindfulness plays a vital role in improving one's performance in different areas of life, such as learning and professional life, by increasing productivity and minimizing mistakes through effective concentration (Fan et al., 2002; Klingberg, 2010).

Levels of mindfulness are influenced by biological factors (sleep and nutrition), psychological factors (anxiety and stress), environmental factors, and social support and positive interpersonal relationships. Factors (Chen & Zeki, 2011). Mindfulness can be enhanced by exercises such as workouts, meditation, and cognitive training that enhance concentration and mental performance (Lutz et al., 2008). The cognitive apprenticeship model is a learning approach that develops students' learning through experience and firsthand engagement with problems in a real work environment, thereby fostering professional competence, self-confidence, and consciousness (Billett, 2009; Bherer et al., 2013).

Recent research evidence suggests that mindfulness programs enhance empathy and prosocial behavior (Crompton et al., 2024), improve cognitive functions (Zainal & Newman, 2024), and significantly reduce test anxiety (Yilmazer et al., 2024).

Cognitive apprenticeship provides learners with a learning environment that mirrors the actual workplace, allowing them to make theory practical and acquire the skills needed to meet the demands of the ever-changing labor market. Its activities are methods, which are modeling, step-by-step guidance, expression and reflection, and exploration, through which students develop their problem-solving and critical thinking skills, being thus ready to face real practical challenges, both in definite professional environments, and generally (Brown et al., 2015; Collins et al., 2018).

The cognitive apprenticeship model, which focuses on guided learning, observation, and gradual skill development, enhances students' attention, concentration, and self-reflection. These processes are closely aligned with mindfulness, as students learn to be aware of their thoughts and actions in the present moment by fostering active engagement, providing feedback, and developing metacognitive awareness, thereby improving mindfulness skills (Pinthong, 2021).

1.1. Study Problem

Excessive and increasing reliance on modern internet- and smartphone-based technological and social developments has led to major changes across many educational and psychological fields. These changes have been reflected in students' performance, learning, level of concentration, and mindfulness. Researchers have noted many challenges affecting students' mindfulness, such as distraction, poor concentration, and fatigue, which can impair their performance in the classroom. Given the possibility of training students to be more mindful in their learning through programs that guide and develop cognitive processes and strategies to stimulate thinking and focus attention, interest arose in developing a training program based on the cognitive apprenticeship model to improve mindfulness among students.

1.2. Study Questions

The study aims to answer these questions:

- Are there statistically significant differences at the significance level ($\alpha \leq 0.05$) between the average scores of members of the experimental and control groups on the mindfulness scale attributable to the training program?

- Are there statistically significant differences at the significance level ($\alpha \leq 0.05$) in mindfulness post-test scores of the experimental and control groups attributable to gender?

1.3. Hypotheses

These hypotheses were formulated in measurable terms consistent with the study's variables and analytical methods (e.g., independent samples t-tests and ANCOVA).

H1: Students taught through the cognitive apprenticeship model will show a statistically significant increase in overall mindfulness scores compared to their pretest results.

H2: Students in the experimental group (cognitive apprenticeship) will achieve higher mindfulness levels than those in the control group (traditional instruction).

H3: The cognitive apprenticeship model will have a significant positive effect on specific mindfulness components (awareness, attention regulation, and emotional balance).

1.4. Study Objectives

The study aims to improve the level of mindfulness among eighth-grade students by developing a training program based on the cognitive apprenticeship model and to identify the effect of gender on the level of mindfulness.

1.5. Study Significance

- Theoretical significance: It lies in the information it can add about the cognitive apprenticeship model and the impact of employing its dimensions on mindfulness.

- Practical significance: The study provides specialists with a training program that can be used to develop individuals' mental abilities, particularly since this study is considered one of the few studies that dealt with a training program concerned with this purpose.

1.6. Study Limitations and Delimitations

This study is limited to eighth-grade students enrolled in school during the 2023/2024 academic year. It is further determined by the tools used, namely the training program and the mindfulness scale, and their psychometric properties.

One limitation of the current study is that participant selection was based on proximity and accessibility rather than random sampling. As a result, the sample may not accurately represent the broader student population. Therefore, the findings should be interpreted with caution and cannot be generalized to all students or educational contexts.

1.7. Study Terminology

- Training program: It is a set of structured activities and experiences borrowed from the cognitive apprenticeship model that were used in the training programs designed by the researchers and tried out on a group of focus students to enhance their mindfulness (Billett, 2009).

- Cognitive Apprenticeship: It is an educational model that aims to provide learning and development opportunities within the actual work environment that will allow learners to apply theory to practice and acquire practical experiences and practical skills needed for them to be successful in the changing labor market (Billett, 2009).

- Mindfulness: It is the state of intense concentration and focus that one must perform activities efficiently and effectively, and is procedurally defined as the score obtained by the respondent on Baer's scale of mindfulness (Baer, 2013).

2. Literature Review

Alwafi's (2023) study aimed to determine how creating an online learning environment grounded in cognitive apprenticeship affected Saudi university students' critical thinking and their interactions with one another during computer-based cooperative learning. In this study, one group was given a pre-test and a post-test as part of a quasi-experimental design. Students' critical thinking skills were assessed using a questionnaire, and student interactions were examined using Social Network Analysis (SNA). The study revealed that after engaging in a cognitive apprenticeship-based online learning environment, students' critical thinking skills increased. The study also demonstrated that when students participated in the online environment designed to incorporate cognitive apprenticeship, their networks grew in size, and their interactions, both within and between groups, increased.

The goal of Al-Shafi'i et al.'s (2020) study was to ascertain how well the cognitive apprenticeship hypothesis developed middle school science students' problem-solving abilities. 35 Cairo-based first-year middle school students comprised the research sample. According to the results, teaching based on the cognitive apprenticeship theory increases students' motivation to study and places them at the center of the learning process.

It allows students to discuss potential solutions, enhances their higher-order thinking skills, and increases their capacity to generate ideas and alternatives in order to make wise decisions. Given the findings, the study suggested that science curricula be developed using the cognitive apprenticeship theory, which emphasises preparing both male and female teachers to teach in accordance with this theory, as it is effective in fostering critical thinking. Rashid et al. (2018) investigated how well students in the Educational Department at the Faculty of Home Economics, Hilwan University, developed their cognitive achievement, awareness of current environmental issues, and academic direction through an enrichment program based on the theory of cognitive apprenticeship. Forty-six female students made up the study sample. The proposed program served as an enrichment program for teaching the selected extracurricular scientific activities, which were based on the list of issues related to home economics specializations. An experimental design was used with one experimental group, which underwent a pre- and post-application of the study measures. The results revealed substantial variance among students' average scores on the cognitive achievement test, the environmental awareness scale, and the academic curriculum scale. There was also a statistically significant relationship between the cognitive achievement test and the environmental awareness scale in the study sample, attributed to the program. The study recommended strengthening enrichment programs and developing awareness of environmental issues and human behavior.

Using a model that centres on four psychological mechanisms—cognitive flexibility, value clarification, self-regulation, and exposure—Brown et al. (2015) investigated the psychological mechanisms underlying the effects of mindfulness on mental health. These mechanisms are linked to favourable health outcomes. To verify if this model could account for the correlations on a sample of 944 college students, the study employed a multidimensional mindfulness measure. All outcomes (stress, anxiety, and depression symptoms) except alcohol issues and all aspects of mindfulness, except observation, exhibited an association with expected trends, according to the data. However, psychological mechanisms were not shown to play a role as mediators between mental health and mindfulness.

Al-Ezzi (2013) examined the degree of mindfulness among university students. The researcher-prepared scale was applied to a sample of 500 students from the University of Diyala in Iraq. The data were statistically processed, and the following results were obtained: The level of mindfulness was high among university students, with statistically significant differences by gender (females, males), in favor of males. There were no statistically significant differences by specialization (scientific vs. humanities), but there were statistically significant differences in the interaction between gender and specialization.

Napoli et al. (2005) examined the effect of mindfulness training on teaching concentration and attention to a sample of 308 basic stage students in the United States of America, divided into two experimental and control groups, and were subjected to a training program. It lasted 24 weeks,, and their mindfulness was evaluated using the formative assessment. The study showed significant differences between participants and nonparticipants in mindfulness training.

A review informed the design of the program of research on mindfulness and cognitive apprenticeship. Studies on cognitive apprenticeship, including those by Al-Wafi (2023), Al-Shafie et al. (2020), and Rashid et al. (2018), have shown how beneficial it is for improving cognitive accomplishment, motivation, problem-solving skills, and critical thinking in a variety of educational contexts. Although they rarely examined their impact on emotional or metacognitive elements such as mindfulness, previous research on cognitive apprenticeship (e.g., Alwafi, 2023; Al-Shafi'i et al., 2020; Rashid et al., 2018) showed beneficial effects on students' cognitive and problem-solving abilities. This gap was specifically identified as the primary driving force of the current investigation.

Studies on mindfulness, including Brown et al. (2015), Al-Ezi (2013), and Napoli et al. (2005), highlighted its role in improving focus, attention, emotional regulation, and mental health, while considering demographic differences. More critical thinking was applied to the discussion of mindfulness studies. We noted that while this research supported the benefits of mindfulness for emotional and attentional control, they frequently employed brief interventions without incorporating formal cognitive or social learning elements. As a result, little is known about the relationship between mindfulness development and guided experiential learning, often known as cognitive apprenticeship.

By fusing the cognitive apprenticeship model with mindfulness training, the current study closes the gap and offers empirical proof of the ways in which mentorship, guided modeling, and reflection help schoolchildren become more mindful. This study contributes to understanding how cognitive apprenticeship improves mindfulness through real-world learning experiences that strengthen self-awareness, emotional control, and attention regulation, by integrating findings from both fields.

In contrast, mindfulness focuses on improving concentration and emotion management, whereas cognitive apprenticeship emphasizes interactive learning to foster critical thinking and practical skills. According to prior research, no study used a cognitive apprenticeship-based training program to cultivate mindfulness, even though numerous studies addressed each of these two factors in relation to other themes. This gap highlights the importance of the current study because it provides a more engaging program for cultivating mindfulness, which enhances student learning in the classroom, increases active engagement, boosts energy levels, and changes the role of students from passive recipients of knowledge to active producers of it.

3. Methodology

For the purposes of this study, the experimental method was used by a quasi-experimental design with the two groups, and with a pre-test and a post-test. The two groups underwent a pre-test on the mindfulness scale that was prepared for this purpose. Then only the experimental group

underwent the training program, and after completing the implementation of the program, the post-test was applied to both groups. Table 1 illustrates the study design.

Table 1. The Design of the Study

Control Group	O1	—	O2
Experimental Group	O1	X	O2

X Training program

O1 Pre-test

O2 Post-test

3.1. Study Sample

The study sample consisted of 80 male and female students purposively chosen from the eighth grade in two public schools (one for males and one for females) in Ma'an Education Directorate, as each grade has two divisions, in addition to their closeness to the researchers' workplace. To comply with ethical research standards, written consent was obtained from the students and their parents, and they were informed that the information would be used for scientific research and kept completely confidential.

After identifying the schools involved in the study, the study sample was randomly distributed across the two groups to achieve parity in numbers and gender. Only the experimental group underwent the training program, and both groups were administered the pre-measurement test using the mindfulness scale prepared for this study. Table 2 shows the distribution of the study sample across the experimental and control groups by gender.

Table 2. The Distribution of the Two Groups According to Gender

Gender	Experimental Group	Control Group	Total
Males	20	20	40
Females	20	20	40
Total	40	40	80

3.2. The Tools of the Study

To measure the impact of the training program on the degree of mindfulness, the translated and customized Baer (2013) scale for the Arab environment by Al-Behairi et al. (2014) was used, which in its final form consists of (39) items. For this study and to verify the validity of the scale, it was presented to seven reviewers—university professors—specialized in educational psychology, measurement, and evaluation, to demonstrate the soundness of the wording of its linguistic paragraphs, their suitability to what they were designed to measure, and their consistency with the dimension to which they belong. Their comments and suggestions were considered.

In addition, the correlation coefficient of each statement of the scale with the sub-score on the target skill was calculated. They ranged between (0.235 – 0.645), which are statistically significant values at the significance level ($\alpha \leq 0.05$), indicating the contribution of each statement of the scale to the overall.

To verify the reliability of the scale, it was administered to a pilot sample of 20 male and female students, and the test-retest method was used, with a 1-month interval between the first and second

administrations. The Cronbach Alpha measure was used to verify the internal consistency, and the results showed that the value of the reliability coefficient using the test-retest method for the scale was 0.82, while the internal consistency method was 0.75, which are acceptable values for this study.

The total score of the scale was dealt with, which includes the five dimensions (observation, description, acting with awareness, lack of judgment, and lack of interaction). A five-point Likert scale was used, with responses ranging from (not completely applicable), the lowest score, to (completely applicable), the highest score. Of these, (19) items were corrected in reverse. The total score for the scale ranged from 39 to 195, with higher scores indicating greater mindfulness in the individual.

3.3. The Training Program

To achieve the purpose of the current study, a training program was developed based on the cognitive apprenticeship strategy, following a review of its components and steps, formulation of objectives, and determination of appropriate activities. The program addressed various training conditions that align with its objectives and the target age group. After being designed, the training program was presented to five arbitrators, specialized university professors at Jordanian universities, and their comments were used to refine the program and achieve the desired benefit.

Three sessions per week (Monday, Wednesday, and Friday) were held during the five weeks of the intervention. To ensure students were awake and focused, the sessions were scheduled during the morning class period, from 9:00 to 9:45 a.m., and lasted 45 minutes each. The intervention took place over about 15 sessions, totaling 11.25 hours. To track participation, attendance was tracked for each session.

The following presumptions form the basis of the program:

- Learning happens by hands-on experience. Direct exposure to abilities and information in a real-world setting is necessary for effective learning.
- A learning environment where students may participate in practical and meaningful activities is offered by cognitive apprenticeship.
- Modelling and mentoring are essential for skills development.
- Gradual provision of support where learners start receiving a lot of guidance and help, and then this support is gradually reduced until they become independent.
- Thinking out loud: Learners express their ideas and strategies out loud while learning, thus enhancing their understanding and revealing any misconceptions.
- Self-immersion in the task helps learners develop critical and analytical thinking skills.
- Analyzing personal performance and thinking about possible ways to improve is an essential component of the learning process.
- Learning occurs best in a social environment where learners can interact with peers and with experts.
- Learning is context-dependent: knowledge and skills are most effective when they are learned in the context in which they are to be used.
- Cognitive apprenticeship focuses on presenting knowledge and skills in practical, real-world contexts.
- Learners' internal motivation is an important component in achieving educational success.

The training program consisted of 17 sessions, each lasting 45 minutes. It relies on several strategies, including dialogue and discussion, theoretical educational sessions, interactive workshops,

directed practical training, periodic assessments and feedback, comprehensive applied projects, group work, modeling, and support-and-reinforcement-based learning.

The mindfulness scale was administered before and after the training program was implemented in both the experimental and control groups. To determine the effectiveness of the program, the training sessions focused on the following skills: Modeling, Guiding and Polishing, Thinking out loud, Gradual removal of support, and Cognitive training.

3.4. Study Variables

First: independent variables:

- Cognitive apprenticeship program.
- Group: Control group and experimental group.
- Gender: Male and female.

Second, the dependent variable: the degree of mindfulness.

3.5. Procedures of the Study

The procedural steps of the study can be summarized as follows:

- In order to enable participants to use these abilities in real-world scenarios, the training program sessions were designed with the theoretical framework and evaluated prior research in mind.
- Conducting the training sessions by a trained researcher holding a PhD in Educational Psychology. Each session included a set of specific outcomes related to the targeted skill, along with a variety of training activities and strategies. Appendix I provides further details.
- Applying the scale to the study sample and marking it according to its instructions.
- Determining the experimental and control groups, considering the homogeneity between the two groups.
- Applying the training program to the students of the experimental group for a period of five weeks, with three sessions each week.
- Re-applying the scale to both groups at the end of the application of the training program.
- Analyzing statistical data and interpreting the results in the light of the theoretical framework and previous studies.

3.6. Uniformity of the Two Groups

To ensure uniformity between the two groups prior to measurement, means and standard deviations were calculated, and the T-test for independent samples was used to determine the significance of the differences, as shown in Table 3.

Table 3. Results of T-Test for Independent Samples

Group	Mean	Standard Deviation	T-Value
Experimental	130.200	11.171	.014 -
Control	130.250	12.182	

Table 3 shows no significant differences between the experimental and control groups, confirming their uniformity.

4. Results and Discussion

4.1. Results Related to the First Question

To answer the first question, which states: “Are there statistically significant differences at the significance level ($\alpha \leq 0.05$) between the average scores of members of the experimental and control groups on the mindfulness scale attributable to the training program?”, the means and standard deviations were calculated on the pre- and post-test for the two groups. Table 4 shows the means, standard deviations, and adjusted means for the two groups on the mindfulness scale, after adjustment for the pre-test effect.

Table 1. The Means, Standard Deviations, and Adjusted Means After Adjusting for the Effect of the Pre-Test for the Two Groups on the Mindfulness Scale

Group	N	Adjusted Mean	SD	95% Confidence Interval
Experimental	40	143.09	11.23	[139.37, 146.82]
Control	40	131.71	13.38	[127.99, 135.43]

As shown in **Hata! Başvuru kaynağı bulunamadı.** there is an apparent difference between the average scores of the members of the two groups on the post-test, as the means of the scores of the members of the control group on the post-test was (131,700), while the means of the members of the experimental group was (143,100), which indicates that the means of the scores of the members of the experimental group on the post-test is higher than the that of the control group on the same test. The adjusted means also show that the experimental group obtained an adjusted mean of (143.093), while the control group obtained an adjusted mean of (131.707) with a similar standard deviation (1.869). The value of the 95% confidence interval ranges for the adjusted mean of the experimental group (139.371 - 146.815), and for the control group (127.985 - 135.429), indicating that there is a clear and constant difference between the two groups that cannot be attributed to chance, as there is no overlap between the two confidence intervals.

To determine whether the differences between the mean scores of the two groups were statistically significant, analysis of covariance (ANCOVA) was used, with the post-test as the dependent variable, the group as the independent variable, and the pre-test as the covariate. Table 2 presents the results of the analysis of covariance comparing the average performance of the experimental and control group members on the adjusted post-test.

Table 2. The Results of the Analysis of Covariance Comparing the Average Performance of the Experimental and Control Group Members on the Adjusted Post-Test

Source of difference	Eta-squared	Freedom degrees	Squared Means	P-Value	Significance level	η^2_p
Pre-test	825.669	1	825.669	5.907	.017	0.071
Group	2592.762	1	2592.762	18.550	.000	0.194
Error	10762.331	77	139.771			
Adjusted Total	14187.200	79				

It is evident from Table 2 that there were statistically significant differences in the post-test between the members of the experimental and control groups, in favor of the experimental group attributed to the training program, where the calculated P-value reached (18,550) with significance level (0.000), which is a statistically significant value at the significance level ($\alpha \leq 0.05$), where the value of the post-test mean of the experimental group was (143.093), while the mean of the control group was (131.707), which indicates that the mean of the scores of the members of the experimental group on the post-test is higher than that of the scores of the control group (11.386). This result is reinforced by the partial eta squared value ($\eta^2p = 0.194$), which indicates that the training program explains 19.4% of the variance in performance after adjusting the effect of the pre-test, which is a large percentage according to statistical standards, indicating that the program has a clear practical impact, not just statistical significance. Together, these results indicate the effectiveness of the training program in improving the performance of members of the experimental group relative to the control group, reflecting the program's success in achieving its goals.

It is evident that there was a clear improvement in the experimental group's performance on the mindfulness post-measuring scale, indicating the contribution of the training program used in the study to effectively increase the degree of mindfulness.

The influence of the training program can be ascribed to employing the cognitive apprenticeship strategy and the skills it contains, which entirely contribute to building a flexible and organized knowledge base that enables trainees to recognize their abilities and benefit from them in adapting to miscellaneous situations and the context in which they take place, which has contributed to changing their ways of thinking within social contexts in which they exist.

The result of implementing the training program is consistent with what was indicated by (Rogoff, 2003), that there cognitive apprenticeship has a positive impact on acquiring experiences and social interactions, and that the probability of refining the performance of individuals by trainees acquiring practical and cognitive skills while improving concentration and attention besides the ability to apply theoretical knowledge in practical contexts while reducing stress and anxiety, improving professional performance, and increasing efficiency through a collaborative and conscious learning environment.

It is noted that the effectiveness of the training program in the present study is in line with the results of studies that showed the effectiveness of training programs prepared based on cognitive apprenticeship, as this result is consistent with the results of the studies of (Al-Shafi'i et al., 2020; Alwafi, 2023), which indicated the constructive role of training programs grounded on cognitive apprenticeship in developing many thinking and problem-solving skills.

4.2. Results Related to the Second Question

To answer the second question, which states: "Are there statistically significant differences at the significance level ($\alpha \leq 0.05$) mindfulness post-test scores of the experimental and control groups attributable to gender?", the t-test was used for independent samples to examine the differences between the average performance of members of the experimental group on the mindfulness post-measuring scale and their differences according to gender variable as shown in Table 3.

Table 3. The Results of the t-test for the Average Performance of Members of the Experimental Group on the Mindfulness Post-Measuring Scale According to Gender

Gender	Mean	Standard Deviation	T-Value	Significance
Males	143.450	15.58	3.144	.001
Females	131.350	13.70		

It is noted from Table 3 that there are statistically significant differences on the mindfulness post-measuring scale between the average performance of the male and female members of the experimental group in favor of the males, as the calculated t-value reached 3.144, which is a statistically significant value at the significance level ($\alpha \leq 0.05$).

This result is consistent with the study by Al-Ezzi (2013), which found differences in the degree of mindfulness attributed to the gender variable, in favor of males. This may be explained by social factors that encourage young males at an early stage of life to adopt qualities such as autonomy and emotional control, which may indirectly lead to the development of mindfulness skills. On the other hand, females may be more inclined to address feelings and emotions, which may affect how they respond to the mindfulness scale. Not to add that, while mindfulness can be a valuable tool for stress management, men may handle stress and tension differently than women.

According to other studies, socially established gender roles that emphasise empathy and emotional expressiveness may explain why women exhibit greater emotional awareness and interpersonal sensitivity (Nolen-Hoeksema, 2012). Conversely, men frequently exhibit reduced emotional openness but more cognitive control (Thompson & Voyer, 2014). These social tendencies may explain the higher mindfulness ratings among female study participants.

5. Conclusions and Recommendations

The study's findings suggest that implementing the curriculum could help pupils become more aware. In order to help students manage their attention and emotions, schools can incorporate these programs into their curricula or extracurricular activities. However, they must make sure that their implementation is tailored to the unique cultural and contextual characteristics of each educational setting.

The use of a non-random sample is one of the study's drawbacks that should be taken into account, as it may affect how representative the findings are of the general population. Furthermore, cultural and contextual variations across different contexts restrict the findings' generalisability.

In light of the study's conclusions, the following suggestions can be made:

- Focusing on the real-world uses of cognitive apprenticeship and enhancing academic programs with activities created specifically for this objective.
- Creating additional training courses aimed at cultivating mindfulness and connecting it to different facets of thought processes.
- Future research should be done to reproduce the findings in various locales with diverse social and cultural circumstances.
- Students' involvement and attention may have been impacted by differences in their daily routines, even though the training was held in the morning to maximize focus. Different time arrangements should be investigated in future studies to evaluate their effects on learning results and engagement.
- To improve external validity, future research can duplicate the study using bigger and more varied samples from various geographical locations and educational contexts.

Declarations

Conflicts of Interest. The authors declare no conflict of interest.

Ethical Approval. This study was conducted in accordance with ethical standards. Informed consent was obtained from all participants and their parents or guardians. The study was approved by the Ethics Committee of the authors' university.

Data Availability Statement. The data that support the findings of this study are available from the corresponding author upon reasonable request.

Acknowledgments. Not applicable.

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About the Contributor(s)

Sami Fawwaz Aljazi, PhD – Associate Professor, Faculty of Educational Sciences, Al-Hussein Bin Talal University, Jordan. His research focuses on educational interventions and cognitive development.

Email: samialjazi@ahu.edu.jo

ORCID: <https://orcid.org/0000-0001-9321-0733>

Amjad Farhan Alrekebat, PhD – Associate Professor, Faculty of Educational Sciences, Al-Hussein Bin Talal University, Jordan. His main research interests include mindfulness, cognitive apprenticeship, and educational psychology.

Telephone: +962772120402

Email: amjad.f.alkibat@ahu.edu.jo / amjadamjad74@yahoo.com

ORCID: <https://orcid.org/0000-0002-3815-8669>

Murad Ahmad Al-Bustanji, PhD – Associate Professor of Special Education, Faculty of Educational Sciences, Special Education Department, Al-Hussein Bin Talal University, Jordan. His research interests include special education and program evaluation.

Email: mbustanji@ahu.edu.jo

ORCID: <https://orcid.org/0009-0006-0146-7552>

Appendix I.

Summary — Training Program (17 Sessions)

No.	Objective / Learning Outcomes	Main Activities	Materials & Tools	Homework / Notes
1	Introduction, building trust, presenting program objectives and the concept of mindfulness	Ice-breaker activity, self-introduction, program overview	Slides, participant handbook	Record a feeling/thought at the end of the day
2	Introduction to mindful breathing	Deep breathing exercise, breath awareness	Audio recordings, exercise cards	Practice breathing twice daily
3	Body Scan practice	Guided body scan, sharing feelings	Facilitator guide, mat/blanket	Practice body scan at home
4	Awareness of thoughts without judgment	Thought recording exercise, group discussion	Worksheets, pens	Write down 3 thoughts daily
5	Awareness and regulation of emotions	Emotion recognition exercise, role play	Emotion cards, illustrations	Describe a situation and its emotional impact
6	Five senses awareness	Mindful tasting/listening/seeing activities	Various sensory materials	Practice the five senses daily
7	Mindful communication	Paired mindful conversation activity	Conversation question sheet	Try active listening with family
8	Dealing with distractions	Sustained attention exercise, strategy discussion	Written scenarios	Apply stop-and-redirect strategy
9	Mindful time management	Daily planning activity, prioritization	Daily schedules	Implement daily plan for one week
10	Mindfulness in school learning	Role play of classroom situations, focus strategies	Reminder stickers	Try two focus strategies
11	Self-awareness and appreciation	Positive traits writing activity	Worksheets	Write down 5 personal achievements
12	Self-compassion	Positive self-talk exercise	Guided texts	Write a self-support letter

No.	Objective / Learning Outcomes	Main Activities	Materials & Tools	Homework / Notes
13	Compassion towards others	'Put yourself in their shoes' activity	Pictures/short stories	Observe reactions when interacting with others
14	Mindful anger management	Mindful pause technique	Step guide, reminder cards	Record a situation where anger was handled mindfully
15	Review of learned skills	Interactive activities summarizing previous sessions	Review sheets	Select two skills to practice
16	Continuity plan	Develop a personal plan for continued practice	Personal plan template	Start implementing the plan
17	Final evaluation and celebration	Post-test, sharing experiences, certificate distribution	Post-test questionnaire, certificates	—

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