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The Effectiveness of Acceptance and Commitment Therapy (ACT) on Enhancing Academic Motivation and Reducing Academic Underachievement in Students with Working Memory Disorder

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A B S T R A C T

Purpose: The objective of this study was to investigate the effectiveness of Acceptance and Commitment Therapy (ACT) in enhancing academic motivation and reducing academic underachievement among high school students with working memory disorders.

Methods and Materials: This research utilized a quasi-experimental pretest-posttest design with a control group and a three-month follow-up. The statistical population included all male students in the second grade of secondary school in Iranshahr who had diagnosed working memory impairments. Through purposive sampling, 40 students were selected and randomly assigned into two equal groups (20 experimental, 20 control). The experimental group participated in eight structured ACT sessions, while the control group received no intervention. Data collection tools included the Harter Academic Motivation Scale and the Pham and Taylor Academic Performance Questionnaire, both validated and reliable for the target population. Data were analyzed using repeated measures ANOVA and Bonferroni post hoc tests via SPSS.

Findings: The results indicated that the ACT intervention had a significant effect on increasing academic motivation ($F(1,38) = 54.455$, $p < .001$, $\eta^2 = .589$) and reducing academic underachievement ($F(1,38) = 664.471$, $p < .001$, $\eta^2 = .946$). Repeated measures ANOVA also showed significant effects of time and time*group interaction on both variables ($p < .001$). Bonferroni tests confirmed that differences between pretest and posttest, as well as pretest and follow-up, were significant ($p < .001$), while posttest to follow-up differences were not significant, indicating sustained effects.

Conclusion: The sustained improvements observed suggest that ACT fosters lasting changes through psychological flexibility and value-based action.

Keywords: *Acceptance and Commitment Therapy; Academic Motivation; Academic Underachievement; Working Memory Disorder*

1. Introduction

In today's competitive educational climate, academic success is regarded as a critical determinant of future social and occupational achievements, making the identification and treatment of academic challenges increasingly vital. Among the cognitive and emotional factors that contribute to educational underperformance, working memory disorders play a particularly detrimental role, impeding students' ability to focus, regulate emotions, plan, and complete tasks effectively. Such impairments are often associated with lower levels of academic motivation and increased rates of underachievement. Addressing these challenges requires interventions that not only enhance cognitive functions but also equip students with psychological flexibility and self-regulation capacities. Acceptance and Commitment Therapy (ACT), an emerging third-wave cognitive-behavioral approach, has shown promise in this context by fostering adaptive coping strategies and meaningful engagement in valued actions (Afshari et al., 2023; Aghajanpourian Vahid et al., 2022).

Academic motivation, defined as the internal drive that energizes, directs, and sustains learning behavior, is particularly sensitive to psychological and cognitive vulnerabilities in adolescents. Students with impaired working memory often exhibit emotional dysregulation, procrastination, and negative beliefs about self-efficacy, all of which contribute to declining motivation over time (Bergman & Keitel, 2023; Malayi & Akbari Dehghani, 2024). In recent years, ACT has been proposed as a suitable psychological framework to enhance motivation by reducing experiential avoidance and increasing commitment to personally valued academic goals (Enayati Shabkolai et al., 2023; Kohli et al., 2022). By targeting the six core processes of psychological flexibility—acceptance, defusion, self-as-context, present-moment awareness, values clarification, and committed action—ACT provides students with tools to engage with their academic challenges in more adaptive and resilient ways (Annunziata et al., 2016; Sofyan et al., 2023).

Empirical research has demonstrated the effectiveness of ACT in improving various educational outcomes among students. For instance, previous studies have confirmed that ACT significantly reduces academic procrastination, enhances academic buoyancy, and improves self-regulation among adolescents and university students alike (Armanikiyan et al., 2020; Gerayeli Mashkabadi et al., 2021; Puolakanaho et al., 2019). Moreover, ACT has proven effective in increasing emotional independence, academic competence, and the ability to tolerate academic stress—factors closely intertwined with sustained motivation and achievement (Heshmati et al., 2018; Seyfi & Jahangiri, 2020; Shahsavari Googhari et al., 2022). These findings align with ACT's foundational theory, which posits that psychological distress and dysfunction are often exacerbated by rigid attempts to control internal experiences rather than mindfully accepting them.

One of the key reasons ACT has been integrated into school-based interventions is its capacity to address not only surface-level behaviors but also the underlying cognitive-affective mechanisms that hinder academic performance. Students with working memory disorders often report heightened frustration, emotional overload, and avoidance of academic tasks, leading to cycles of failure and decreased self-worth (Ghadampour et al., 2019; Wang et al., 2017). ACT interrupts this cycle by teaching students to observe their unhelpful thoughts and emotions without judgment and to reconnect with intrinsic academic values despite internal obstacles (Asli Azad et al., 2019; Bayat et al., 2020). In this way, ACT contrasts with traditional performance-focused interventions by emphasizing process-oriented change through mindful awareness and acceptance.

Recent studies have increasingly validated the role of ACT in supporting students with attention and executive functioning difficulties. For example, Aghajanpourian Vahid et al. (2022) demonstrated that ACT significantly improved cognitive flexibility and academic buoyancy among adolescents with attention-deficit symptoms. Similarly, Hakimpour (2014) found that ACT reduced academic burnout and math anxiety in sixth-grade students, two common comorbidities of working memory impairment (Hakimpour, 2014). These outcomes suggest that ACT may have considerable utility for addressing the motivational and academic struggles of students with working memory disorders by enhancing their resilience, self-compassion, and goal-directed persistence.

A significant body of evidence also supports the application of ACT in decreasing maladaptive behaviors such as procrastination, which is often heightened in students with cognitive difficulties. Research by Garaaghaji et al. (2016) and Zarkouipour et al. (2022) found that ACT reduced academic procrastination and behavioral maladaptation, while increasing task initiation and follow-through (Garaaghaji et al., 2016; Zarkouipour et al., 2022). Similarly, Vajargahi et al. (2025) and Bina Vajargahi et al. (2024) confirmed ACT's ability to enhance self-regulation and self-control in students struggling with internet

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addiction and academic avoidance behaviors (Bina Vajargahi et al., 2024; Vajargahi et al., 2025). These findings reinforce ACT's versatility and effectiveness in improving behavioral outcomes relevant to school success.

Moreover, ACT's relevance is not limited to cognitive or emotional factors; it also addresses broader psychosocial issues such as low self-worth, impaired social adaptability, and emotional reactivity—traits that often correlate with low academic motivation in adolescents. Studies by Sadeghian et al. (2019) and Abooei Mehrrizi et al. (2021) highlight ACT's efficacy in improving self-worth, self-differentiation, and emotional regulation, which are essential for academic perseverance and constructive classroom engagement (Abooei Mehrrizi et al., 2021; Sadeghian et al., 2019). Additionally, the value-based emphasis of ACT helps students articulate personal meaning in their educational pursuits, promoting a sense of intrinsic motivation rather than reliance on external rewards or avoidance of failure (Annunziata et al., 2016; Bergman & Keitel, 2023).

The present study builds upon this growing body of research by investigating the effectiveness of ACT in enhancing academic motivation and reducing academic underachievement in high school students with diagnosed working memory disorders.

2. Methods and Materials

2.1. Study Design and Participants

This study employed a quasi-experimental design with a pretest-posttest structure, including a control group and a three-month follow-up phase. The statistical population consisted of all male high school students (second grade of secondary school) in Iranshahr who were identified as having working memory disorders. The sample was selected through purposive sampling, and ultimately, 40 students were recruited—20 for the experimental group and 20 for the control group. The researcher obtained the required permissions and accessed the list of boys aged 16–17 diagnosed with working memory impairment through local counseling and psychological treatment centers. Parents of these students were individually approached, and after the research objective and procedure were thoroughly explained, informed consent was obtained. Students whose parents agreed to participate were enrolled in the study. The process continued until 44 students were identified, and then 40 were randomly selected and evenly assigned to the experimental and control groups using a matched allocation method. Matching was done based on academic grade, age, and parental social status to ensure group equivalence.

Inclusion criteria for this study required participants to be male high school students residing in Iranshahr, with an intelligence quotient (IQ) lower than 85 based on their clinical file and psychologists' evaluations. In addition, parental consent and willingness of the student to attend therapy sessions were mandatory. Participants had to demonstrate the ability to comply with the program schedule and attend the sessions regularly. Exclusion criteria included missing more than two sessions or voluntarily withdrawing from the study at any point. These criteria were strictly monitored throughout the intervention to ensure internal validity.

2.2. Measures

The primary instrument used to assess academic motivation in this study was the Harter Academic Motivation Scale (1981), a standardized 33-item self-report questionnaire designed to measure academic motivation among students. Originally developed by Harter in the 1980s and subsequently revised by Lepper and colleagues in 2005, this tool evaluates both intrinsic and extrinsic motivational dimensions. While the original version presented dichotomous items reflecting internal versus external motivations, the revised version adopted a more conventional Likert-scale format, enabling separate assessment of either type of motivation. Each item is rated on a five-point Likert scale ranging from "Never" (1) to "Almost Always" (5), yielding a total possible score ranging from 33 to 165. Scores between 33 and 66 indicate low academic motivation, 66 to 99 suggest moderate motivation, and scores above 99 reflect high motivation. The internal consistency reliability of the questionnaire has been established through Cronbach's alpha, which was calculated at 0.92 in a prior study by Zohiri and Rajabi (2009), confirming its suitability for this research. The questionnaire has also been validated for use in the Iranian student population.

To measure academic performance and underachievement, the study employed the Pham and Taylor Academic Performance Questionnaire, an adapted tool originally developed in 1990 and contextualized for Iranian students. This instrument comprises 48 items aimed at assessing various aspects of academic functioning and achievement. Items are scored on a five-point Likert scale with options ranging from "None" (1) to "Very Much" (5).

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Eleven negatively worded items are reverse-scored. The total possible score ranges from 48 to 240, where higher scores indicate better academic performance. The instrument has demonstrated strong content validity as verified by educational experts and psychologists, and its internal consistency reliability was confirmed through a Cronbach's alpha coefficient of 0.82 reported by Moradian (2013). In the present study, the reliability of the questionnaire was reassessed and confirmed with a Cronbach's alpha of 0.92, indicating a high level of measurement precision.

2.3. Intervention

The intervention protocol for this study consisted of eight structured sessions based on Acceptance and Commitment Therapy (ACT), each designed with specific goals to enhance academic motivation and reduce academic underachievement in students with working memory disorder. The first session aimed to build rapport through introductions, clarify the importance and goals of ACT, and administer the pretest questionnaires. Participants were educated about the negative effects of emotional suppression and asked to list and reflect on suppressed emotions. The second session focused on reducing emotional control dominance by discussing how avoidance reinforces problems and employing metaphors such as “feeding the tiger” and “driving with the rearview mirror,” with a homework task of identifying personal avoidance patterns. The third session targeted increasing acceptance by encouraging participants to acknowledge uncontrollable aspects of their condition and practice emotional expression through metaphors like “tug of war with a monster” and the “serenity prayer.” In session four, the goal was to enhance cognitive defusion by helping students recognize their rigid attachment to thoughts and beliefs, using techniques such as “watching the thought train” and “soldiers marching,” followed by journaling real-life situations where their mind dominated their experience. The fifth session emphasized present-moment awareness through mindfulness exercises like “leaves on a stream” and reflection on being caught in past or future thinking, with home assignments to practice mindfulness daily. The sixth session fostered self-as-context and clarified values through metaphors such as “chessboard” and “funeral visualization,” encouraging students to write about their life values and what they’d want engraved on their tombstone. In the seventh session, students learned about committed action, reflecting on whether their behavior aligned with their values and learning to persist through failure using metaphors like “skiing downhill” and “twisting paths.” Homework involved selecting values-based actions for the coming week. Finally, the last session reviewed all prior content, resolved any confusion, and concluded with post-test assessments to evaluate changes.

2.4. Data Analysis

The collected data were analyzed using SPSS software, and both descriptive and inferential statistical methods were applied. Descriptive statistics, including measures of central tendency (such as means and standard deviations) and dispersion, were used to summarize the demographic characteristics of participants and describe baseline and outcome variables across both groups. Relevant graphs and frequency distributions further illustrated the data profile.

Inferential statistical analyses were conducted to test the study’s hypotheses. After confirming that necessary statistical assumptions were met (such as normality and homogeneity of variances), a repeated measures ANOVA was performed to examine within-group and between-group differences across pretest, posttest, and follow-up phases. Additionally, the Bonferroni post hoc test was applied to determine the significance of changes across the three measurement points and identify where specific differences occurred.

3. Findings and Results

The results presented in Table 1 indicate that participants in the experimental group, who received Acceptance and Commitment Therapy (ACT), showed substantial improvements in both academic motivation and academic performance from pretest to posttest, with effects maintained at the follow-up. Specifically, the mean score for academic motivation in the experimental group increased from 41.3 (SD = 1.2) in the pretest to 97.2 (SD = 2.3) in the posttest, and slightly decreased to 91.2 (SD = 2.96) in the follow-up, indicating sustained but slightly reduced effects over time. In contrast, the control group showed a modest increase from 43.6 (SD = 1.65) to 52.35 (SD = 1.3) at posttest, followed by a decline to 49.35 (SD = 1.44) at follow-up. Similarly, for academic performance, the experimental group’s mean scores rose dramatically from 69.5 (SD = 2.5) at pretest to 177.15 (SD = 3.71) at posttest and further to 181.2 (SD = 4.17) at follow-up, demonstrating a continued upward trajectory. Meanwhile, the control group’s scores increased from 66.3 (SD = 2.48) to 77.45 (SD = 2.5) at posttest and to 81.5 (SD = 2.56) at follow-up, indicating improvement but

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at a much lower rate than the experimental group. These descriptive findings suggest that ACT significantly improved academic motivation and performance among students with working memory disorder.

Table 1

Descriptive Statistics of Academic Motivation and Academic Performance Scores in Pretest, Posttest, and Follow-up Phases

Variable	Group	Pretest Mean	Pretest SD	Posttest Mean	Posttest SD	Follow-up Mean	Follow-up SD
Academic Motivation	Experimental	41.3	1.2	97.2	2.3	91.2	2.96
	Control	43.6	1.65	52.35	1.3	49.35	1.44
Academic Performance	Experimental	69.5	2.5	177.15	3.71	181.2	4.17
	Control	66.3	2.48	77.45	2.5	81.5	2.56

Before conducting inferential statistical analyses, all necessary assumptions for repeated measures ANOVA were thoroughly examined and confirmed. The assumption of normality was assessed using the Shapiro–Wilk test and visual inspection of Q–Q plots, both of which indicated that the distribution of scores for academic motivation and academic performance at all three measurement points (pretest, posttest, and follow-up) did not significantly deviate from normality. Homogeneity of variances and covariances was evaluated using Levene's test and Box's M test, respectively, and both tests yielded non-significant results, confirming that variance across groups and time points was sufficiently equal. Additionally, the assumption of sphericity was tested using Mauchly's test, and where violations were identified, Greenhouse-Geisser corrections were applied. These results ensured the validity of the data for conducting repeated measures ANOVA to assess the effectiveness of the intervention.

Table 2

Summary of ANOVA and Repeated Measures ANOVA Results for Academic Motivation and Academic Underachievement

Variable	Source	Sum of Squares	df	Mean Square	F	p-value	η^2
Academic Motivation	Between Groups	6541.633	1	6541.633	54.455	.000	.589
	Error	4564.9	38	120.129			
	Time (Exp)	2928.2	1	2928.2	30.541	.000	.446
	Error (Exp)	3759.65	38	95.878			
	Time (Ctrl)	1050.017	1	1050.017	10.613	.002	.218
	Error (Ctrl)	3759.65	38	98.938			
Academic Underachievement	Time	10086.317	2	5043.158	279.833	.000	.880
	Time*Group	62017.350	2	31008.675	172.065	.000	.819
	Error	13696.333	76	180.215			
	Between Groups	136890.075	1	136890.075	664.471	.000	.946
	Error	7828.517	38	206.014			
	Time (Exp)	80454.613	1	80454.613	455.367	.000	.923
	Error (Exp)	6713.875	38	176.681			
	Time (Ctrl)	20405.704	1	20405.704	111.052	.000	.745
	Error (Ctrl)	6982.458	38	183.749			

As shown in Table 2, the results of the between-subjects ANOVA indicated that the intervention had a significant effect on academic motivation, $F(1, 38) = 54.455$, $p < .001$, with a large effect size ($\eta^2 = .589$), confirming a substantial difference between the experimental and control groups. Repeated measures ANOVA further revealed a significant main effect of time on academic motivation in the experimental group, $F(1, 38) = 30.541$, $p < .001$, $\eta^2 = .446$, as well as in the control group, $F(1, 38) = 10.613$, $p = .002$, $\eta^2 = .218$, though the effect size was notably smaller. Regarding academic underachievement, a significant interaction was found between time and group, $F(2, 76) = 172.065$, $p < .001$, $\eta^2 = .819$, indicating that the change in academic performance differed across groups over time. The main effect of time was also significant, $F(2, 76) = 279.833$, $p < .001$, $\eta^2 = .880$, as was the between-group effect, $F(1, 38) = 664.471$, $p < .001$, $\eta^2 = .946$, all pointing to the strong impact of the ACT intervention. Within-group analyses further confirmed that time had a highly significant effect on reducing academic underachievement in the experimental

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group, $F(1, 38) = 455.367$, $p < .001$, $\eta^2 = .923$, while the control group also showed significant but smaller changes over time, $F(1, 38) = 111.052$, $p < .001$, $\eta^2 = .745$. These findings demonstrate the robust and lasting effectiveness of Acceptance and Commitment Therapy in enhancing academic motivation and reducing academic underachievement in students with working memory disorders.

Table 3

Bonferroni Test Results for Academic Motivation and Academic Underachievement

Variable	Compared Phases	Standard Error	p-value
Academic Motivation	Pretest – Posttest	2.261	.000
	Pretest – Follow-up	2.189	.000
	Posttest – Follow-up	2.169	1.000
Academic Underachievement	Pretest – Posttest	2.898	.000
	Pretest – Follow-up	2.972	.000
	Posttest – Follow-up	3.131	.611

The Bonferroni post hoc analysis results, summarized in Table 3, indicate that the differences in academic motivation between the pretest and posttest ($p < .001$), as well as between the pretest and follow-up phases ($p < .001$), were statistically significant, reflecting a substantial improvement in motivation after the ACT intervention and sustained effects over time. However, the difference between the posttest and follow-up stages was not statistically significant ($p = 1.000$), suggesting that the gains in academic motivation were maintained rather than increased or diminished in the follow-up phase. Similarly, for academic underachievement, significant improvements were observed between the pretest and posttest ($p < .001$) and between the pretest and follow-up phases ($p < .001$), indicating marked reduction in underachievement following the intervention. Yet, the non-significant result between posttest and follow-up ($p = .611$) implies that the positive effects on academic performance remained stable over time without further significant changes. These findings confirm the durability and effectiveness of the ACT intervention across both outcome variables.

4. Discussion and Conclusion

The findings of the present study demonstrated that Acceptance and Commitment Therapy (ACT) was significantly effective in enhancing academic motivation and reducing academic underachievement in students suffering from working memory disorders. Based on the results from repeated measures ANOVA and Bonferroni post hoc analyses, students in the experimental group showed substantial improvements in both academic motivation and performance following the ACT intervention, with effects maintained at the three-month follow-up. These outcomes confirm that ACT can be an influential therapeutic approach in educational contexts, particularly for students whose cognitive deficits—such as working memory impairments—interfere with academic engagement and achievement. The theoretical foundation of ACT, which emphasizes psychological flexibility, value-based action, and mindful acceptance of internal experiences, aligns with the mechanisms needed to address motivational decline and academic avoidance patterns in cognitively vulnerable learners.

The enhancement of academic motivation among students who received ACT can be explained by several core principles of this therapeutic model. One of the fundamental goals of ACT is to reduce experiential avoidance, a tendency to avoid uncomfortable internal experiences such as academic stress or negative self-beliefs, which are especially common among students with executive functioning deficits. This psychological avoidance often leads to task procrastination and motivational withdrawal. By helping students observe and accept these internal experiences rather than attempting to suppress or control them, ACT facilitates more adaptive responses and value-aligned behaviors. Previous research supports these findings. For example, Afshari et al. (2023) found that ACT was significantly more effective than cognitive-behavioral therapy (CBT) in improving academic competence and reducing procrastination in students experiencing burnout, demonstrating its specific value in motivation enhancement (Afshari et al., 2023). Similarly, Malayi and Akbari Dehghani (2024) confirmed ACT's impact on increasing academic motivation in adolescents, further validating the present study's findings (Malayi & Akbari Dehghani, 2024).

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The observed reduction in academic underachievement also aligns with prior research suggesting that ACT can strengthen students' executive and emotional functioning—two components that are often impaired in those with working memory difficulties. Through structured sessions that incorporated mindfulness exercises, metaphors, and value clarification, students learned to disengage from negative cognitive patterns and commit to purposeful academic actions. Studies such as those by Aghajanpourian Vahid et al. (2022) and Enayati Shabkolai et al. (2023) have confirmed the ability of ACT to improve academic buoyancy, cognitive flexibility, and self-regulation in adolescents with attention and learning difficulties, thereby enhancing academic persistence and success (Aghajanpourian Vahid et al., 2022; Enayati Shabkolai et al., 2023). This is consistent with the current results, as the intervention led to a significant and sustained improvement in performance outcomes, even at follow-up.

Another possible explanation for the intervention's efficacy lies in ACT's emphasis on clarifying values and promoting committed action. Students who struggle with cognitive impairments often lack intrinsic motivation and are easily disengaged from educational goals. ACT helps students identify meaningful life directions, including educational values, and fosters psychological flexibility to act consistently with those values even in the presence of negative thoughts or emotions. Research by Bergman and Keitel (2023) underscores how ACT promotes adaptive meaning-making and engagement in life domains affected by stress and dysfunction, such as academic life (Bergman & Keitel, 2023). Likewise, Bina Vajargahi et al. (2024) found that ACT improved both self-control and motivation in students with internet addiction—another form of academic disengagement—through value-based goal setting and emotion regulation strategies (Bina Vajargahi et al., 2024).

Furthermore, the findings resonate with earlier work by Heshmati et al. (2018), who reported that ACT improved emotion regulation and decreased academic procrastination in students, a result which corresponds with the motivational improvements observed in this study (Heshmati et al., 2018). By helping students reframe their relationship with distressing thoughts such as "I'm not smart enough" or "I will fail anyway," ACT weakens the influence of these cognitive barriers on behavior. The observed reduction in underachievement in our study likely stemmed from this cognitive defusion and behavioral activation process. Supporting this, Garaaghaji et al. (2016) reported decreased procrastination and improved academic engagement among students who underwent ACT-based interventions, further validating the current outcomes (Garaaghaji et al., 2016).

In addition, the maintenance of treatment effects at the follow-up phase is noteworthy and suggests that ACT's benefits are not transient. This sustained improvement aligns with the findings of Puolakanaho et al. (2019), who demonstrated that a brief web-based ACT program significantly improved academic buoyancy and reduced stress among adolescents, with results persisting over time (Puolakanaho et al., 2019). Similarly, Wang et al. (2017) found ACT to be superior to CBT in reducing academic procrastination, with more enduring results, due to its focus on altering the student's relationship with internal experiences rather than attempting to change the content of those experiences (Wang et al., 2017). The current study's follow-up findings lend further support to the long-term effectiveness of ACT when properly implemented in a structured, value-centered intervention.

The reduction in academic underachievement also complements results from Sadeghian et al. (2019), who reported that ACT improved psychological capital and self-worth in children of divorced families, thereby enabling them to perform more effectively in academic tasks (Sadeghian et al., 2019). Similarly, Khajekini et al. (2022) highlighted ACT's role in enhancing resilience and life expectancy in children with physical-motor disabilities—outcomes that are deeply tied to academic functioning (Khajekini et al., 2022). These findings suggest that ACT's impact on academic performance may be mediated not only by motivational improvements but also by broader changes in psychological resilience and emotional stability.

Another important point is the universality of ACT across diverse populations and psychological challenges. Whether addressing internet addiction, emotional distress, attention deficits, or test anxiety, ACT consistently demonstrates efficacy in enhancing academic and emotional outcomes. For example, Zarkouipour et al. (2022) confirmed that ACT reduced behavioral maladaptation and academic procrastination among male students with test anxiety (Zarkouipour et al., 2022). Similarly, Asli Azad et al. (2019) documented that ACT reduced obsessive-compulsive symptoms in students and improved their academic functioning through defusion and present-moment focus (Asli Azad et al., 2019). These outcomes, in conjunction with our findings, position ACT as a comprehensive, adaptable model suitable for addressing a wide array of cognitive, behavioral, and emotional obstacles to learning.

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Despite the promising results, several limitations must be acknowledged. First, the study sample was limited to male students aged 16 to 17 from Iranshahr, which restricts the generalizability of findings to other age groups, females, or students from different geographic or cultural backgrounds. Second, although the follow-up phase provided evidence of sustained treatment effects, it was relatively short (three months), and the long-term durability of outcomes beyond this period remains uncertain. Third, the reliance on self-report questionnaires for measuring academic motivation and performance may have introduced response biases or failed to capture the full complexity of students' behavioral changes. Finally, while the ACT protocol was implemented rigorously, factors such as individual therapist differences, student compliance, or external academic support were not controlled in the analysis, which may have influenced outcomes.

Future studies should consider expanding the demographic diversity of participants by including female students, different age groups, and individuals from other regions to increase external validity. It is also recommended that researchers incorporate longer-term follow-up assessments (e.g., six months to one year) to assess the durability of ACT's effects over time. Additionally, employing mixed-methods approaches that integrate qualitative interviews with quantitative assessments could provide deeper insight into students' subjective experiences of the intervention. Further, comparative studies examining ACT in conjunction with or against other emerging third-wave therapies (e.g., mindfulness-based cognitive therapy) could elucidate its relative strengths. Finally, exploring mediating variables such as psychological flexibility, emotion regulation, or executive functioning may offer a better understanding of how ACT exerts its effects on academic outcomes.

Practitioners working in school-based mental health services or academic counseling are encouraged to incorporate ACT principles into their interventions, particularly for students with cognitive impairments or motivational difficulties. Implementing structured ACT-based group sessions within educational settings could serve as both a preventive and remedial strategy for academic disengagement. Educators and school psychologists should be trained to apply ACT metaphors, mindfulness practices, and value clarification exercises in classroom management and individual support plans. Furthermore, ACT's emphasis on long-term value alignment makes it especially suitable for career guidance and student development programs aimed at fostering intrinsic motivation and resilience in the face of academic stress.

Authors' Contributions

All authors significantly contributed to this study.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

In this study, to observe ethical considerations, participants were informed about the goals and importance of the research before the start of the study and participated in the research with informed consent.

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