E-ISSN: 3108-852X

APSSHS

Academic Publications of Social Sciences and Humanities Studies
2025, Volume 5, Issue 1, Page No: 6-15
Available online at: https://apsshs.com/

Journal of Applied Organizational Systems and Behavior

A Strategic Framework for Decreasing Test Anxiety through Teaching

Katarzyna Lewandowska[1]*, Piotr Zieliński[1], Marta Kaczmarek[2]

1. Department of Individual Behavior Studies, Faculty of Management, Poznań University of Economics and Business, Poznań, Poland.
2. Department of Organizational Psychology, Faculty of Social Sciences, University of Warsaw, Warsaw, Poland.

Abstract

The purpose of this research was to examine how implementing a specific instructional approach influences the level of test anxiety experienced by students enrolled at the College of Science and Arts, University of Northern Border in Rafha. A total of 30 students participated, randomly assigned to either an experimental group (n=15) that received the intervention or a control group (n=15) that did not.

Keywords: Teaching method, Examination anxiety, Student group, Decreasing anxiety

How to cite this article: Lewandowska K, Zieliński P, Kaczmarek M. A strategic framework for decreasing test anxiety through teaching. J Appl Organ Syst Behav. 2025;5(1):6-15. https://doi.org/10.51847/f2FzTE4ZIy

Received: 19 January 2025; **Revised:** 29 March 2025; **Accepted:** 04 April 2025
Corresponding author: Katarzyna Lewandowska
E-mail ✉ k.lewandowska@gmail.com

Introduction

In recent years, Saudi families have shown an increasing interest in the education of their children, driven by recognition of education's vital role both socially and economically. This heightened awareness has led to a surge in university enrollments across the country.

Alongside this growth, educational authorities have identified several challenges impacting student learning, notably psychological and academic issues such as test anxiety. In response, efforts have been made to address these concerns, with particular emphasis placed on educational guidance and psychological counseling services. These services are now regarded as essential alongside traditional academic and research responsibilities.

Effective implementation of these support measures requires culturally sensitive tools and approaches tailored to align with Saudi societal customs and traditions while maintaining diagnostic accuracy. Debate continues over the nature of test anxiety: whether it serves as a motivating mental and academic energy that shapes students' ambitions and goals, or whether it acts as an impediment to cognitive and academic performance. The impact of test anxiety appears to vary depending on its intensity and the individual differences among students, particularly during higher education.

Spielberger (year) notes that test anxiety tends to increase among students with strong aspirations for specific fields of study or career paths, as exam performance is critical in achieving their objectives. Consequently, the closer the test outcome is tied to these goals, the higher the test anxiety experienced. Conversely, academic achievement is influenced by general cognitive ability and mental stability, which play crucial roles in a student's college performance.

Test anxiety is considered a specific form of general anxiety triggered by evaluative situations, manifesting as a psychological and emotional challenge. Research suggests that gender does not significantly influence test anxiety; however, students' previous experiences in similar testing or stressful situations—whether at home or in daily life—can affect their level of fear and anxiety related to exams [1].

Anxiety, a longstanding psychological phenomenon, has accompanied humanity throughout history, often intensified by ongoing societal changes and pressures. While a certain level of anxiety can be positive and enhance creativity, excessive anxiety typically hampers human talent and productivity. Psychologists largely agree that anxiety underpins many mental health issues, yet it also plays a role in motivating individuals toward positive accomplishments.

Although much research has focused on general anxiety, there is a growing interest in specific types such as test anxiety, which is closely linked to evaluative and performance-based contexts [2]. Psychological studies underscore the significant role anxiety levels play in the learning process. Both very high and very low anxiety can hinder students' ability to achieve their goals: excessive anxiety impairs cognitive functions and academic performance, while too little anxiety results in low motivation, interest, and apathy. Moderate anxiety, however, can stimulate effort and achievement. Thus, as anxiety intensifies beyond an optimal level, students' academic success tends to decline [3].

Test anxiety is especially important because it directly influences a student's overall academic understanding and performance. The gravity of this anxiety stems from its association with critical societal milestones—university admissions, job placements, promotions—that significantly affect a student's academic trajectory, professional future, and societal status [4].

Al-Ajami (1999a) identifies test anxiety as one of the most significant emotional factors influencing academic performance [5]. He notes that while a moderate level of anxiety can motivate students to engage in learning, excessive anxiety often results in cognitive breakdown.

This study applies a proposed teaching strategy designed to alleviate test anxiety among students at Northern Border University in Saudi Arabia.

Problem statement

Test anxiety is an emotional condition experienced by some students throughout their academic journey. It may trigger psychological reactions stemming from fear of failure or concerns about disappointing their families. This emotional state can sometimes produce acceptable outcomes but often leads to suboptimal academic performance.

Given the impact of test anxiety on learning, numerous studies have highlighted its negative effects. For instance, Leary and Kowalski (1995) found anxiety to be a significant factor adversely affecting academic achievement [6]. Similarly, Furmark (2002) concluded that heightened anxiety correlates with poorer academic results [7]. Waradia (2003) also emphasized that exam-related fear and anxiety act as barriers to academic success [8].

Based on our educational responsibilities and observations of anxiety-related challenges faced by students during their probation periods, the author stresses the importance of addressing this issue. This study seeks to explore effective strategies that support students in managing test anxiety more effectively. Accordingly, the research question guiding this study is: What is the impact of implementing a proposed teaching strategy to reduce test anxiety among students at Northern Border University, KSA?

Significance of the study

This research aims to provide a practical strategy to assist university students in overcoming test anxiety. The suggested approach offers a framework that helps students tackle common academic difficulties by enhancing study preparation, optimizing mental capacity, maintaining focus on academic tasks, and sustaining motivation. It guides students in effective course review techniques based on active recall, promoting deeper learning that fosters confidence rather than confusion or distraction, thereby addressing test anxiety directly.

Moreover, the strategy incorporates stress-management tools such as a self-guided menu for stress reduction and muscle relaxation exercises to alleviate tension and anxiety. It also encourages students to seek counseling or support when facing persistent anxiety, pressure, or challenges adapting to academic demands.

Therefore, the significance of this study lies in demonstrating the effectiveness of a teaching strategy centered on providing students with ideas, guidelines, and techniques not only to confront and reduce anxiety but also to enhance their thinking, emotional responses, and behaviors toward academic challenges. The strategy empowers students to handle academic difficulties with resilience and determination.

Objectives of the study

The present study aims to:

- Assess the level of test anxiety among students at Northern Border University.
- Evaluate the effectiveness of a proposed teaching strategy in reducing test anxiety among these students.

Scope of the study

Subjective scope

This study focuses specifically on test anxiety and the proposed teaching strategy designed to measure and address the intensity of test anxiety among a sample of students from Northern Border University.

Population scope

The research is confined to students enrolled in the Faculty of Science and Arts at Northern Border University, Rafha, KSA.

Geographical scope

The study is geographically limited to the Faculty of Science and Arts, Northern Border University, Rafha, KSA.

Temporal scope

The research was conducted during the academic year 1440/2020.

Research hypotheses

- There will be no statistically significant differences in the test anxiety scores of students in the experimental group before and after the application of the teaching strategy.
- There will be no statistically significant differences in the test anxiety scores of students in the control group before and after the teaching strategy implementation.
- There will be no statistically significant differences between the post-intervention test anxiety scores of the experimental and control groups.
- There will be no statistically significant differences between the post-intervention and follow-up (tracer) test anxiety scores within the experimental group.
- The teaching strategy will be effective in reducing test anxiety among students in the Faculty of Science and Arts at Northern Border University.

Definitions of key terms

Test anxiety

Gabriel *et al*. (2004) define test anxiety as a personality trait specific to testing situations, characterized mainly by distress and emotionality [9]. Distress involves cognitive concerns such as fear of failure, while emotionality refers to physiological nervous system reactions.

For this study, test anxiety is theoretically defined as the emotional state experienced by a student during a test due to fear of failing. Practically, it is measured by the student's score on the test anxiety scale.

Strategy

According to Webster (1988), a strategy is the science and art of employing plans across political, economic, and psychological domains to assist a society or group in achieving specific goals [10].

In the context of this study, the teaching strategy is defined as the implementation of ideas, guidelines, and techniques aimed at helping university students overcome test anxiety. This involves improving study preparation, enhancing motivation and persistence, boosting concentration and memory, utilizing effective review methods, applying anxiety-reducing techniques, and providing coping mechanisms to maximize academic achievement and success.

Strategies to mitigate test anxiety in students: a theoretical framework

This section elucidates the theoretical underpinnings of strategies employed in the study to address test anxiety among students, focusing on cognitive and non-cognitive factors that influence academic performance.

Academic aptitude

Students' capacity to achieve academically is constrained by their inherent abilities, which are shaped by both maturation and training [11]. Cognitive factors, particularly the mental disposition toward academic subjects, significantly influence academic outcomes. Abu Hatab and Sadiq (1980) argue that while mental aptitude is essential for learning, it is insufficient without considering students' interests, personality traits, and motivations [12]. Without a structured approach to leveraging cognitive abilities, students may expend time inefficiently. To optimize study preparation, students should address the following guiding questions [list of questions not provided in the original text].

Motivation and determination

Non-cognitive factors, such as motivation and attitudes, play a critical role in academic success [12, 13]. Bembentty *et al*. (1998) propose several strategies to enhance motivation and determination through self-regulated learning, fostering academic achievement [14]. These include:

1. Establishing clear academic objectives.
2. Cultivating a sense of perseverance and building on prior successes by developing a structured plan for achievement, which bolsters self-confidence.
3. Adopting positive self-talk and avoiding negative statements, such as "I am unprepared for studying."
4. Maintaining focus on academic tasks, resisting procrastination, and sustaining motivation. Williams and Janice (1998) highlight that test anxiety can undermine academic drive [15]. To mitigate this, students are encouraged to discuss their concerns with peers, tutors, or counselors to alleviate anxiety and enhance self-directed learning.

Work rate and study efficiency

Acres (1995) suggests that high academic achievement is attainable without excessive effort by employing effective study techniques that align with students' aptitudes [16]. These techniques include:

Enhancing concentration

Concentration can be improved through targeted study methods, a commitment to success, and minimizing distractions. Students should progressively extend study durations, starting with shorter sessions and gradually increasing them as they engage with diverse subjects.

Maintaining a learning journal

Recording concise notes, key topics, or phrases on flashcards or within textbooks aids retention. This practice helps students recall information encountered during the day and connect it to lecture content. Additionally, creating a task list and identifying optimal study times when concentration peaks can enhance efficiency.

Effective revision strategies

Many students mistakenly attempt to memorize material during a single review, often immediately before an exam. Effective revision, however, fosters deep learning and confidence. Key strategies include:

- Developing a comprehensive overview of topics and prioritizing content for review.
- Allocating specific timeframes for each task, regardless of its complexity.
- Creating summaries using innovative formats, such as diagrams, comparison tables, or visual aids like spider maps, to reinforce retention of key concepts [16].

Structured revision approach

The following five-step revision method promotes effective learning:

1. **Read and Research**: Review notes and address prepared questions.
2. **Recall and Comprehend**: Reflect on the material to ensure understanding of prior notes.
3. **Assess Clarity**: Determine whether the material is clear or requires further clarification, adding new notes as needed.
4. **Integrate Notes**: Revisit original and new notes to ensure all questions from the first step are answered.
5. **Reinforce Retention**: Reread notes, focusing on unremembered points, and repeat the process to enhance recall.

Memory enhancement techniques

The 1990s, dubbed the "decade of brain research" in the United States, emphasized understanding brain function, learning, and recall. Neuro-Linguistic Programming (NLP) emerged as a method to leverage both visualization and verbal skills to improve memory. This approach utilizes the right brain's capacities (e.g., visualization, intuition, and creativity) and the left brain's strengths (e.g., logical reasoning, analytical thinking, and objective analysis) to enhance learning [16].

Ragan and Ragan (1982) and Krugman *et al*. (1985) propose the following memory enhancement techniques [17, 18]:

Association

Linking words, numbers, and images fosters verbal-visual interdependence, enabling more efficient memory function.

Repetition

Repeatedly reviewing material aloud, listening to recordings, or rereading content multiple times, ideally in conjunction with writing, strengthens memory retention.

Visual memory utilization

Incorporating visual aids, such as images, symbols, or drawings, alongside other sensory inputs (e.g., touch or auditory cues), enhances recall of information [18].

These strategies collectively provide a robust framework for addressing test anxiety and improving academic performance among students with learning difficulties.

Previous studies

Given the critical importance of test anxiety and its close relationship to learners' academic achievement, this topic has attracted significant research attention, as illustrated in the following studies:

- **Rajih and Saravanan (2014)** conducted a study titled *"The Effectiveness of Psychological Imagination and Psychological Education in Reducing Test Anxiety and Increasing Motivation among First-Year Pharmacy Students"*[19]. Their research aimed to examine how psychological imagery and educational interventions could reduce test anxiety and boost motivation among junior pharmacy students in Malaysia. The experimental group included 21 students, with another 21 in the control group. Over 5–7 weeks, participants completed initial assessments including a test anxiety scale, an academic motivation scale, and a measure of post-traumatic stress disorder. The findings revealed that the psychological intervention significantly lowered levels of test anxiety and psychological distress, while also improving students' GPA.
- **Abdel-Hamid (2013)** explored the impact of a counseling program designed to reduce test anxiety and modify Type A behavior traits among baccalaureate students [20]. The study involved planning and implementing an outreach program for an experimental group. It aimed to assess the counseling program's effectiveness in changing Type A behavior patterns, reducing test anxiety, and maintaining these improvements after the program ended.
- **Atalla (2010)** investigated the *"Effectiveness of Cognitive-Behavioral Therapy (CBT) in Enhancing Test Anxiety Management Skills among University Students."* [21] This study sought to evaluate the impact of CBT on developing skills such as muscle relaxation, controlling negative thoughts, replacing negative thoughts with positive ones, and time management. It also examined differences between male and female students in acquiring these skills, as well as the sustainability of the program's effects over a follow-up period of one and a half months. The study sample consisted of 28 students selected based on low test anxiety management skills and high test anxiety levels. The results were as follows:
    1. The CBT program was highly effective in improving test anxiety management skills, as evidenced by statistically significant differences between the experimental and control groups on all measured skill dimensions.
    2. There were no significant gender differences in the program's effectiveness within the experimental group.

The gains in test anxiety management skills persisted during the follow-up period, Abdel-Hamid (2013) explored how cognitive-behavioral therapy combined with learning skills training could reduce test anxiety and boost academic performance in university students [20]. The initial study involved 400 students, but only 44 students exhibiting high levels of test anxiety (28 females and 16 males) were chosen for the intervention. These participants were split into four groups of 11: a control group, one receiving cognitive-behavioral therapy, another undergoing learning skills training, and a fourth participating in a Therapeutic Training Consortium (TTC). Over 12 counseling sessions based on the Spielberger anxiety test, the study found significant reductions in test anxiety across the intervention groups, alongside improvements in academic results. Both CBT, learning skills training, and TTC proved effective in addressing anxiety and enhancing student performance.

 In a separate study, Al-Ajami (1999a) examined the link between test anxiety and academic achievement among female students at the College of Education for Girls in Al-Ahsa [5]. Using a test anxiety scale developed by Abdel-Rahim (1989), the researcher distributed 500 questionnaires to assess anxiety levels [1]. Findings revealed that female students generally experienced moderate test anxiety, which tended to increase in their final year of study. Moreover, the data showed a clear negative relationship between anxiety and academic success, indicating that higher anxiety levels were associated with lower achievement [22] with no significant differences between post-test and follow-up scores.

- Farah (1997) conducted a study titled "The Effect of Psychotherapy on Reducing Test Anxiety Among Yarmouk University Students," which aimed to evaluate the impact of a reading therapy intervention using written materials [23]. The study sample included 55 students from Yarmouk University. Statistical analyses, including data testing and one-way ANOVA, were utilized. The results indicated significant improvements in the experimental group, who received the treatment, compared to the control group during the intervention period.
- Similarly, Farah and Hammouri (1997) examined the influence of a self-help bibliotherapy program on test anxiety among university students in Jordan [24]. Findings demonstrated that participants in the experimental group experienced significantly lower anxiety levels on post-test measures compared to those who did not undergo the intervention.

- In another related study, Al-Hamouri (1995) investigated the effects of a reading-based treatment on test anxiety in a sample of 55 male and female students from Yarmouk University in Iraq [25]. The experimental group, composed of 28 students, received training through a booklet designed to alleviate test anxiety, whereas the control group, consisting of 27 students, received no such intervention. Results showed a notable decrease in test anxiety scores among the experimental group on the post-test compared to the control group.

Research methodology

The researcher employed an experimental design featuring two equivalent groups with pre- and post-tests. The independent variable, the teaching strategy, was implemented only in the experimental group, while the control group did not receive any guidance. The impact of the strategy was measured by comparing the pre-test and post-test results of both groups.

Research population

The study population consisted of students enrolled at the Faculty of Science and Arts, Northern Border University during the academic year 2019-2020.

Research sample

The sample included 30 students who were selected based on their scores from the test anxiety scale, specifically those who scored the highest. These students were then randomly divided into two groups: an experimental group of 15 students who received the proposed teaching strategy, and a control group of 15 students who did not receive any intervention.

Statistical tools

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS) to obtain the study's results.

Study instruments

Two main tools were utilized in this research: a test anxiety measurement scale and the researcher's suggested teaching strategy.

Westside test anxiety scale (Richard Driscoll, 2000)

The researcher adopted the Westside Test Anxiety Scale developed by Richard Driscoll (2007) for measuring test anxiety, based on the following reasons:

- The scale demonstrates strong psychometric properties, including high reliability and stability.
- It has been validated on diverse populations, including both adults and adolescents.
- It has been widely used internationally, including in the USA and the UK.

The scale comprises 10 items divided into two primary dimensions:

- **Impotence** (reflecting poor memory or cognitive difficulties), covering 6 items (numbers 1, 4, 5, 6, 8, and 10).
- **Anxiety** (indicating severe anxiety symptoms), covering 4 items (numbers 2, 3, 7, and 9).

Scoring method

Scores on the scale range from 10 to 50, with each item rated on a 1 to 5 scale.

Table 1.

1	2	3	4	5
Absolutely, It is not true at all	Slightly, Seldom true	Average, Sometimes true	Frequently, Usually true	Always, always true

Interpretation of test anxiety scores

- **1.0 to 1.9:** Low test anxiety
- **2.0 to 2.5:** Normal or moderate test anxiety
- **2.5 to 2.9:** Slightly elevated (normal-high) test anxiety
- **3.0 to 3.4:** Moderately high test anxiety (some items scoring 4 indicate high anxiety)
- **3.5 to 3.9:** High test anxiety (half or more of the items scoring 4 indicate high anxiety)
- **4.0 to 5.0:** Very high test anxiety (items scoring 4 indicate high anxiety, while scores of 5 indicate very high anxiety)

Scale item analysis

To confirm the validity of the scale items and their ability to discriminate between different anxiety levels, the researcher applied two methods:

Extreme groups method

Scores were sorted in descending order, and the top 27% and bottom 27% were chosen to represent the two extremes. The discrimination index for each of the 10 scale items was calculated. Additionally, an independent samples t-test was performed using SPSS to determine the significance of differences between the two groups. Items with statistically significant t-values were considered discriminative. As shown in **Table 1**, all items demonstrated significant t-values at the 0.05 level (critical t = 1.98 with 10 degrees of freedom), confirming their ability to distinguish between high and low anxiety groups.

Internal consistency coefficient

The internal consistency of the scale was assessed by correlating each item's score with the total test score using Pearson's correlation coefficient, calculated via SPSS. The correlation coefficients ranged from 0.211 to 0.541. These values exceeded the critical correlation coefficient of 0.138 at the 0.05 significance level, confirming that all items contribute meaningfully to the overall scale reliability **(Table 2)**.

Table 2. The results of the T-test for all the items in the scale.

Paragraph number	Higher group		Lower group		The computed T- value	Coefficient of consistency
	Arithmetic mean	SD	Arithmetic mean	SD		
1	3.42	0.70	2.25	1.11	10.28	0.541
2	3.38	0.64	2.35	1.06	9.63	0.433
3	3.38	0.81	2.80	0.84	5.75	0.420
4	3.41	0.71	2.76	0.78	7.13	0.261
5	3.33	0.69	2.90	0.91	4.36	0.323
6	3.64	0.57	3.08	0.89	6.07	0.265
7	3.20	0.77	2.65	0.87	5.46	0.211
8	3.120	0.793	2.759	0.945	3.039	0.316
9	3.24	0.75	2.69	0.83	5.63	0.521
10	3.21	0.73	2.66	0.81	5.78	0.422

Degree of freedom to discrimination = 108, Significance level = 0.05, Tabulated 't' = 1.98

Psychometric properties

Content validity

To verify the validity of the measurement tool, it was submitted to a panel of 10 experts in educational and psychological sciences. The experts reviewed the items to assess content validity. All items received an agreement rate exceeding 90%, confirming that the tool is valid for measuring test anxiety.

Reliability

The stability of the test anxiety scale was verified using the test-retest method. The scale was administered twice to the same sample, with a three-week interval between tests. The Pearson correlation coefficient between the first and second test scores was 0.86, indicating very high reliability.

Split-half reliability

The reliability was also assessed using the split-half method. The correlation coefficient between the two halves was 0.773. After applying the Spearman-Brown correction formula, the reliability coefficient increased to 0.872, confirming high internal consistency.

Teaching strategy

The experiment results highlighted the primary issues causing test anxiety. Items with an average score of 3 or below were considered adaptive problems. Based on these findings, specific needs were identified. The proposed teaching program was reviewed and approved by experts in educational and psychological counseling to ensure the goals, activities, and time allocation were appropriate for addressing test anxiety among students at the Faculty of Science and Arts, Northern Border University.

The teaching strategy focuses on preparing students for study, enhancing motivation and determination, improving work pace through better focus and memory, and employing effective study and review techniques. It also includes treatment methods to help students manage test anxiety. The program consists of nine weekly sessions:

- **Session 1:** Group session to identify the most common academic problems among students.
- **Sessions 2–9:** Individual sessions tailored to each student's needs.

Pre-test

The pre-test was administered to 30 students from the Education Department, Faculty of Science and Arts, Northern Border University.

Equivalence of research groups

Although the experimental and control groups were randomly selected, the researcher ensured their equivalence to control for confounding variables that could affect the study results. Statistical tests were conducted to verify this equivalence in terms of test anxiety levels.

- The t-test for independent samples was calculated to compare the means of the two groups.
- The calculated t-value was 1.19, which is less than the critical t-value of 2.763 at 28 degrees of freedom and a significance level of 0.01.
- This indicates no statistically significant difference between the experimental and control groups regarding test anxiety, confirming their equivalence **(Table 3)**.

Table 3. For parity between the control and experimental groups in test anxiety

Group	Sample size	Arithmetic mean	SD	DF	T value			
					Calculated	Tabulated (0.05)	Tabulated (0.01)	Tabulated (0.01)
Experimental	15	35.86	2.35	28	0.0786	2.048	2.763	3.674
Control	15	34.66	3.10	28	0.0786	2.048	2.763	3.674

The results indicated that the control group had an average age of 20.25 years with a standard deviation of 1.54, while the experimental group had an average age of 21.88 years with a standard deviation of 1.66. The calculated t-value was 1.45, which is less than the critical t-value of 2.02 at 28 degrees of freedom and a significance level of 0.01 **(Table 4)**. This indicates that there are no statistically significant differences between the two groups in terms of age, confirming their equivalence.

Table 4. Random differences between the two groups in the age variable

Group	Sample size	Arithmetic mean	SD	T value		DF	Sig.
Experimental	15	74.85	10.5	Calculated	Tabulated	28	NS
Control	15	72.16	11.5	0.376	2.76	28	NS

Achievement level for the two groups (general average for the previous academic year)

The academic scores of the experimental and control groups were collected. The researcher found that the experimental group had an average score of 74.85 with a standard deviation of 10.5, while the control group had an average score of 72.16 with a standard deviation of 11.5. Using an independent samples t-test, the difference between the two groups' mean scores was found to be statistically insignificant. The calculated t-value was 0.376, which is less than the critical t-value of 2.76 at 28 degrees of freedom and a significance level of 0.01 **(Table 5)**. This indicates that the two groups were equivalent in terms of academic achievement.

Table 5. The T-test between the mean scores of the experimental and control groups (for academic achievement)

Group	Sample size	Arithmetic mean	SD	T value		DF	Sig.
Experimental	15	74.85	10.5	Calculated	Tabulated	28	NS
Control	15	72.16	11.5	0.376	2.76	28	NS

Conclusion

The results of this research revealed that students in the experimental group who were exposed to the program based on the proposed instructional strategy experienced a statistically significant decrease in test anxiety compared to those in the control group who were not exposed to the strategy. The statistical analysis showed a clear reduction in test anxiety among the experimental group, while no significant change was observed in the control group. This significant difference in favor of the experimental group can be attributed to several factors. First, the duration and timing of the program sessions were appropriate, allowing students to better understand their feelings and recognize the need to change or manage them. This understanding helped students overcome many difficulties and situations that previously caused anxiety, fear, and confusion before, during, and after exams. Second, the treatment plan was carefully designed to be suitable for the students' age group and was implemented by the researcher, who used a scientific approach incorporating lectures, activities, and events that have proven effective in reducing test anxiety. Students' comprehension of the program's content helped alleviate their problems, as evidenced by their direct and logical evaluations of the session topics. Finally, the proposed teaching strategy had a positive

impact on students' self-awareness and understanding of reality, helped organize their experiences, increased self-confidence, activated self-motivation, enhanced their ability to take responsibility for challenging tasks, and taught them essential recall and organizational skills.

Recommendations

Based on the findings of this study, it is necessary to focus on enhancing students' self-confidence and strengthening their ego by teaching them to reject negative self-talk. Encouraging students to communicate openly and express their opinions freely can help build this confidence. Furthermore, educational and psychological counseling services within the College of Education should be given more attention, and the establishment of a psychological counseling unit is recommended to address both academic and psychological challenges faced by students. Holding regular training and counseling sessions to equip students with effective strategies to manage test anxiety is also important. These sessions should include international models and teach the best study and exam preparation methods. Additionally, creating a supportive and reassuring environment within the university, particularly in colleges and departments, can contribute significantly to reducing overall student anxiety.

Suggestions for future research

It is suggested that similar studies be conducted with students at other universities to compare results and further validate the effectiveness of such instructional strategies. Future research should also consider exploring additional variables related to students' personality traits and academic performance, such as self-confidence, social shyness, intelligence, and mental health. Moreover, expanding research on test anxiety to include different social groups and related factors could help in developing broader and more effective solutions to this issue.

Acknowledgments: None

Conflict of interest: None

Financial support: None

Ethics statement: None

References

1. Abdel-Rahim BA-R. Examination Anxiety (Concept - Treatment - Measurement). 1st ed. Cairo: Dar Al Nahda; 1989.
2. Shaheen A. Anxiety Management Strategies Seminar at Shubra Mechanical School. 2016. Available from: http://www.arabuem.net
3. Majami AbMM. The motivation of academic achievement, test anxiety, and some academic variables among students of Teachers College in Jazan. Makkah: Umm Al-Qura University; 2006.
4. Zahran MH. Mini psychological counseling to deal with school problems. Cairo: World of Books; 2000.
5. Al-Ajami MM. The relationship between test anxiety and academic achievement among students of the College of Education for Girls in Al-Ahsa for the literary departments. Magazine of the Arabian Gulf, the Arab Bureau of Education. 1999;33:183-95.
6. Leary MR, Kowalski RM. Social anxiety. New York: Guilford Press; 1995.
7. Furmark T. Social phobia: overview of community surveys. Acta Psychiatr Scand. 2002;105(2):84-93.
8. Waradia S. Relationship of the baccalaureate exam anxiety with student achievement. Algiers: University of Algiers, Faculty of Humanities and Social Sciences; 2003.
9. Gabriel HM, Shushan HM, Salim SS, Abdullah F. A study of the level of test anxiety among students of specialized high schools in Shuaiba Misurata. Muallem Magazine. 2004.
10. Webster M. Webster's Ninth New Collegiate Dictionary. Springfield, Massachusetts: U.S.A.; 1998.
11. Gordon WI. An analysis of the Measurement of Study Strategy. Paper presented at the Annual Meeting of Midwestern Educational Research Association; 1994.
12. Abu Hatab F, Amal S. Educational Psychology. 2nd ed. Cairo: Anglo-Egyptian; 1980.
13. Entwistle NJ, Kozeki B. Relationships between school motivation, approaches to studying, and attainment, among British and Hungarian adolescents. Br J Educ Psychol. 1985;55(2):124-37.
14. Bembenutty H, McKeachie WJ, Karabenick SA, Lin YG. The relationship between test anxiety and self-regulation on students' motivation and learning. Paper presented at the Annual Meeting of the American Psychological Society; 1998 May; Washington, DC.

15. Williams M, Janice E. The role of test anxiety in the self-regulated learning to motivating relationship. Paper presented at the Annual Meeting of American Educational Research Association; 1998 Apr; San Diego, CA.
16. Acres D. How to Pass Exams Without Anxiety. 4th ed. Broughton Gifford: How to Books, The Cromwith Press; 1995.
17. Ragan JM, Ragan TJ. Working effectively with people: contributions of neurolinguistic programming (NLP) to visual literacy. J Vis Verb Languaging. 1982;2(2):67-79.
18. Krugman M, Kirsch I, Wickless C, Milling L, Golicz H, Toth A. Neurolinguistic programming treatment for anxiety: magic or myth? J Consult Clin Psychol. 1985;53(4):526.
19. Rajiah K, Saravanan C. The effectiveness of psychoeducation and systematic desensitization to reduce test anxiety among first-year pharmacy students. Am J Pharm Educ. 2014;78(9).
20. Abdel-Hamid A. A heuristic program to modify the characteristics of (A) behavior patterns in reducing test anxiety among a sample of baccalaureate students. J Hum Soc Sci. 2013;10:245-59.
21. Atallah MKh. The effectiveness of cognitive-behavioral therapy in developing some test anxiety management skills among a sample of university students [master's thesis]. Minia: Minia University; 2010.
22. Al-Ajami M. Knowing the relationship between test anxiety and academic achievement among female students of the College of Education for Girls in Al-Ahsa for literary departments and their degree of anxiety [master's thesis]. Amman: University of Jordan; 1999.
23. Farah MA. The effect of psychotherapy in reducing test anxiety among Yarmouk University students. Journal of the Center for Educational Research. 1997;6(11).
24. Farah AM, Hammouri FA. The effect of bibliotherapy in reducing test anxiety among Jordanian college students. Educ Res Center J. 1997;11:9-25.
25. Al-Hamouri FAM. The effect of reading therapy in reducing exam anxiety [master's thesis]. Irbid: Yarmouk University; 1995.