The Effect of Interaction between Active Learning Strategies and Cognitive Style on Reducing EFL Learners' Reading Anxiety

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Abstract: Objective: This study aimed to investigate the effect of interaction between two active learning strategies (POSSE and Instructional Scaffolding) and cognitive style (Tolerance/Intolerance of Ambiguity) on reducing reading anxiety among EFL learners enrolled in the Reading Skills course at the Arab American University (AAUP)- Jenin, Palestine. **Methodology:** To fulfill the aims of the study, the researcher adopted a quantitative experimental design involving 72 learners assigned to two experimental groups during the summer semester of the academic year (2023/2024). To achieve the study's objectives, the researcher designed the study instruments: 1. The Foreign Language Reading Anxiety Scale (FLRAS). 2. The English as a Foreign Language Tolerance-Intolerance of Ambiguity Scale (EFLTIAS). 3. A Teacher's instructional guide aligned with both strategies. **Findings:** The collected data were analyzed and treated statistically using SPSS. The findings revealed that: 1. There is no statistically significant interaction between the two learning strategies (POSSE and Scaffolding) and cognitive style (tolerance/ intolerance of ambiguity) in reducing reading anxiety among students. 2. There are statistically significant differences at the significance level ($\alpha \leq 0.05$) between the mean scores of the students in the reading anxiety scale from the pre-post reading anxiety scale for the first experimental group (which used the POSSE strategy). 3. There are statistically significant differences at the significance level ($\alpha \leq 0.05$) between the mean scores of the students in the reading anxiety scale from the pre-post-reading anxiety scale for the second experimental group (which used the Scaffolding strategy). **Conclusions & Recommendations:** The researcher recommended the necessity of integrating active learning strategies into EFL curricula and examining their impact in diverse instructional contexts, including distance learning and self-directed learning. Future research should explore long-term interventions and broader learner profiles using highly sensitive affective measures.

Keywords: Interaction, Active Learning Strategies, Cognitive Style, Reading Anxiety.

أثر تفاعل استراتيجيات التعلم النشط والأسلوب المعرفي في خفض القلق القرائي لدى متعلمي اللغة الإنجليزية كلغة أجنبية

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الملخص: الهدف: هدفت هذه الدراسة إلى معرفة أثر التفاعل بين استراتيجيتين للتعلم النشط (تنال القمر والسقالات التعليمية) والأسلوب المعرفي (تحمل الغموض/ وعدم تحمل الغموض) في خفض قلق القراءة لدى متعلمي اللغة الإنجليزية كلغة أجنبية، المسجلين في مساق مهارات القراءة في الجامعة العربية الأمريكية (AAUP)- جنين بالضفة الغربية، فلسطين. **المنهج:** ولتحقيق أهداف الدراسة، اتبعت الباحثة المنهج التجريبي على 72 طالباً وطالبة، مقسمين إلى مجموعتين تجريبيتين، خلال الفصل الدراسي الصيفي من العام الدراسي (2023/2024). ولتحقيق أهداف الدراسة، صممت الباحثة أدوات الدراسة: 1. مقياس قلق القراءة باللغة الأجنبية (FLRAS). 2. مقياس الأسلوب المعرفي (تحمل/ وعدم تحمل الغموض) في الإنجليزية كلغة أجنبية (EFLTIAS). 3. دليل المعلم. **أهم النتائج:** تم تحليل البيانات المجمعة ومعالجتها إحصائيًا باستخدام برنامج SPSS. وقد توصلت النتائج إلى ما يلي: 1. لا يوجد تأثير للتفاعل بين الاستراتيجيتين (تنال القمر والسقالات التعليمية) والأسلوب المعرفي (تحمل/عدم تحمل الغموض) في خفض قلق القراءة لدى الطلبة. 2. توجد فروق ذات دلالة إحصائية عند مستوى الدلالة ($\alpha \leq 0.05$) بين متوسط درجات الطلبة في مقياس قلق القراءة ما قبل وبعد التجربة للمجموعة التجريبية الأولى (التي استخدمت استراتيجية تنال القمر). 3. توجد فروق ذات دلالة إحصائية عند مستوى الدلالة ($\alpha \leq 0.05$) بين متوسط درجات الطلبة في مقياس قلق القراءة ما قبل وبعد التجربة للمجموعة التجريبية الثانية (التي استخدمت استراتيجية السقالات التعليمية). **الاستنتاجات والتوصيات:** وأوصت الباحث بضرورة دمج استراتيجيات التعلم النشط في مناهج اللغة الإنجليزية كلغة أجنبية، ودراسة تأثيرها في سياقات تعليمية متنوعة، بما في ذلك التعلم عن بُعد والتعلم الذاتي. كما اقترحت الباحثة أن تستكشف الدراسات المستقبلية التدخلات طويلة المدى، وأن تتناول ملفات تعلم متنوعة للطلبة، مع اعتماد أدوات قياس وجدانية تتسم بدرجة عالية من الحساسية، لتعميق فهم أثر العوامل الوجدانية في تعلم اللغة.

الكلمات المفتاحية: التفاعل، استراتيجيات التعلم النشط، الأسلوب المعرفي، قلق القراءة.

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Introduction

The current study intends to investigate the impact of the interaction between active learning strategies (POSSE and Instructional Scaffolding) and cognitive style (tolerance/intolerance of ambiguity) on reducing reading anxiety among EFL learners. Reading anxiety is a psychological condition marked by fear, nervousness, and unease during reading tasks, significantly hindering comprehension and academic performance. It is often caused by factors such as text difficulty, fear of making mistakes, and academic pressure (Horwitz, Horwitz, & Cope, 1986). Foreign Language Reading Anxiety (FLRA), which has a detrimental impact on comprehension, memory retention, and reading task avoidance, is particularly prevalent in foreign language acquisition (Wu, 2008; Elaldi, 2016). It manifests through physical symptoms such as sweating and trembling (Spielberger, 2015), cognitive challenges like poor concentration (Marsela, 2017), and emotional responses such as fear and self-doubt. Addressing reading anxiety through effective interventions and teaching strategies is essential for enhancing students' comprehension and overall academic success.

Based on constructivist philosophy, the POSSE strategy was created in 1991 by Carol Englert and Tory Mariage and emphasizes active learning by integrating of new and existing knowledge. The five steps of the POSSE reading comprehension approach are: predict, organize, search, summarize, and evaluate. It facilitates active engagement with texts and improves comprehension by guiding students through the pre-, while-, and post-reading stages (Mertosono et al., 2020). Based on Vegotsky's Zone of Proximal Development (ZPD), instructional scaffolding offers learners short-term assistance as they go from reliance to independence in their learning. By progressively cutting back on outside help, this method aims to foster critical thinking and problem-solving abilities (Wood, Bruner, & Ross, 1976; Vygotsky, 1978). According to research, scaffolding improves student confidence, lowers task-related anxiety, and improves academic achievement (Lajoie, 2005; Meyer & Turner, 2002).

When learning a second language, cognitive style -in particular, tolerance for ambiguity- is crucial. Intolerance causes discomfort in ambiguous settings and frequently impedes language learning. Tolerance of ambiguity indicates a person's capacity to deal with unclear or incomplete information without stress (Budner, 1962; Erlina et al., 2019). Higher ambiguity tolerance helps students succeed academically by enabling them to adjust more effectively to new situations and language acquisition difficulties (Riding & Cheema, 1991; Chapelle & Roberts, 1986).

Study problem

The phenomenon of reading anxiety among first-level students in reading skills courses manifests in nervousness, fear, and rejection when asked to read aloud, often due to fear of stuttering and embarrassment in front of peers. This anxiety negatively impacts their comprehension and academic achievement. Observing this recurring issue, the researcher aims to address it by integrating two active learning strategies, POSSE and Instructional Scaffolding, into the teaching process to enhance reading skills and alleviate anxiety.

According to the researcher's experience instructing English language courses at a University in the Gaza Strip - Palestine, students often exhibit weak performance in English skills, particularly reading comprehension, due to limited use of active learning strategies. This deficiency is further

documented through exams and discussions with colleagues. The lack of effective strategies hinders students' ability to develop key reading comprehension skills, such as identifying main ideas, skimming, and scanning.

The study seeks to find out how active learning strategies (POSSE and Instructional Scaffolding) and cognitive style affect EFL learners' reading comprehension skills and reduce their reading anxiety. By incorporating these strategies, the study aims to develop essential reading sub-skills, enhance learners' engagement with reading tasks, improve their academic performance and reading comprehension achievements, and create positive attitudes toward learning English.

Study questions

The present study will respond to the following questions:

1. What is theoretical framework that underpins the interaction between active learning strategies (POSSE and Instructional Scaffolding) and cognitive style (tolerance/ intolerance of ambiguity) in reducing EFL learners' reading anxiety?

2. Is there an effect of the interaction between the two strategies of active learning (POSSE and Instructional Scaffolding) and Cognitive Style (tolerance/intolerance of ambiguity) in reducing reading anxiety among EFL learners?

Significance of the Study

To the best of the researcher's knowledge, this study is among the first to examine the interaction between teaching POSSE and Instructional Scaffolding strategies and cognitive style in reducing reading anxiety in Palestine. Both the cognitive style English as a Foreign Language Tolerance - Intolerance of Ambiguity Scale (EFLTIAS) and the first Palestinian attempt to create a specialized scale for Foreign Language Reading Anxiety (FLRAS) were created by the researcher. The

FLRAS scale aims to measure reading anxiety levels among EFL learners and identify key factors contributing to its reduction. The EFLTIAS scale aims to identify learners with varying levels of ambiguity tolerance, particularly concerning their reading anxiety and comprehension difficulties. The study seeks to provide deeper insights into this category of students by identifying key factors contributing to the reduction of reading anxiety, thereby enriching the theoretical literature on the subject. Moreover, it contributes to the Arab, particularly Palestinian, academic library by addressing a critical gap in the research. The findings offer insights to inform interventions such as educational strategies, teacher training, and tailored university courses to mitigate reading anxiety and enhance reading comprehension among EFL learners in Palestinian contexts.

Operational Definitions

Interaction: The combined effect of teaching strategies (POSSE and Instructional Scaffolding) and cognitive style (tolerance/ intolerance of ambiguity) to improve reading comprehension and reduce reading anxiety.

Reading Anxiety: Anxiety related to Reading: When a freshman English major is expected to perform in a foreign language, they experience anxiety, which is defined as fear to trepidation. It will be measured using the reading anxiety scale designed by the researcher.

Cognitive style: It means the individual differences among freshman English Majors in processing information including perception, memory, and problem-solving in reading comprehension skills.

POSSE Strategy: It means the Freshmen English Majors ability to: Predict the text's ideas based on the title; Organize these forecasts in an information map; Search for the text's predictions; Summarize the cognitive

map that student created for the concepts in the text, and evaluate by comparing the cognitive map based on the text predictions and the one based prediction to assess its quality.

Instructional Scaffolding: It is a teaching strategy that the teacher uses temporarily to provide a set of guidelines, instructions, activities, resources, and programs that the student needs to achieve a better understanding of reading comprehension skills like previewing, predicting, identifying the main idea and supporting details, m as (previewing, predicting, finding the main idea and supporting details, making inferences, and summarizing, as well as acquire new skills that enable him to continue the rest of his learning on his own.

Study limits

Due to the war and the destruction of university buildings in Gaza, the researcher relocated the study from Al- Azhar University in the Gaza Strip to Arab American University-Jenin in the West-Bank, Palestine. This adjustment ensured study's continuity despite the challenging circumstances, with full adherence to academic integrity and the original objectives.

Human limits: The human limits were limited to freshmen enrolled in Reading Skills course in the English Language Department - Faculty of Art and Education at Arab American University (AAUP) - Jenin in the West-Bank, Palestine the academic year 2023-2024.

Time limits: This study was carried out during the entire summer semester of 2023-2024.

Place limits: This study was restricted to the Faculty of Art and Education - English Language Department at Arab American University-Jenin (AAUP) in the West-Bank, Palestine.

Theoretical Framework

In education, learner-situation interaction study leads to research on individual differences in learners' learning abilities in different learning environments. Studies in educational psychology highlight that learners' aptitudes significantly predict learning outcomes. However, aptitude-treatment interactions (ATI) reveal that these aptitudes interact with educational variables, influencing learning outcomes. Such interactions are crucial for validating aptitude constructs, enhancing instructional strategies, and understanding individual differences in response to situational demands, as highlighted by Cronbach (1957).

Interaction, as defined by Vygotsky (1978), is a process of mutual influence between two or more parties, in which each party adjusts his/her behavior in response to the behavior of the others. Similarly, Piaget (1973) described interaction as a dynamic process within an environment that fosters the development of knowledge or behavior.

Aptitude refers to measurable personal characteristics influencing learning outcomes, whereas treatment refers to modifiable situational variables. When the same treatment has varying effects on individuals according to their aptitudes, this is called an interaction.

Cronbach and Snow (1977) emphasized that ATI highlights the importance of aligning teaching methods with learner characteristics, such as cognitive abilities, learning styles, and psychological traits, to optimize instructional effectiveness. Snow (1989) further confirmed that learner traits like intelligence and cognitive abilities influence the impact of instructional interventions, underscoring the need for targeted instruction.

In the Palestinian context, previous local research has highlighted the existence of moderate to high levels of foreign language

learning anxiety among university students (Qaddomi, 2013). Moreover, Naqeeb and Awad (2011) emphasized the significance of individual learning styles among Palestinian EFL learners, noting that auditory and visual preferences influence how students engage with language instruction. Their findings point to the need for adaptive teaching methods that account for cognitive and perceptual differences in the language classrooms. However, such research has largely overlooked instructional solutions to address the emotional and cognitive challenges learners face. This study addresses this gap by implementing two active learning strategies—POSSE and instructional scaffolding—and examining their impact on both cognitive (reading skills) and affective (reading anxiety) outcomes. The study is further grounded in ATI theory, investigating how learners' cognitive styles—specifically their tolerance or intolerance of ambiguity—interact with instructional treatments to influence educational outcomes. By examining these dimensions, the current study aims to provide a more nuanced understanding of how tailored instruction can improve language learning efficacy.

Empirical framework

The researcher surveyed some relevant experiments, practices, and empirical studies, which were insightful, updated, and enriching. The researcher benefited from the earlier empirical study's methodology, tools, results, and future research. Thus, the current study added new tools, enriched the scanty studies in this respect, and recommended more future research.

Zhou (2024) examined the relation between Chinese EFL learners' reading strategies, reading engagement, and reading anxiety. The study sought to determine whether greater use of strategies and deeper engagement would be associated with reduced anxiety while reading

academic texts in English. A quantitative and descriptive approach was employed to explore the relationships among the variables. The study was conducted in Anhui province, China with a sample of 457 undergraduate students majoring in English as a Foreign Language at several Chinese universities. Data were collected using three instruments: A standardized reading strategy questionnaire, an engagement scale, and the Foreign Language Reading Anxiety Scale (FLRAS). Findings revealed that students who demonstrated higher use of reading strategies and greater engagement—both cognitive and behavioral—tended to experience moderately lower levels of reading anxiety. The study recommended incorporating explicit strategy training in EFL reading instruction to boost learners' confidence and reduce anxiety. Additionally, it suggested that instructors should focus on enhancing student engagement through active learning techniques to create a more supportive reading environment.

Hafiza et al. (2024) investigated the relationship between eighth-grade students' reading anxiety and comprehension levels at SMPN 3 Bukittinggi. 140 eighth-grade students from SMPN 3 Bukittinggi participated in the study, which used complete sampling. Data was collected via questionnaires and examinations. Rxy (0.668) > rtable (0.167), according to statistical analysis using the t-test at a significant level of α=5%, suggesting a positive correlation between reading comprehension and reading anxiety. The researchers recommended developing educational programs to reduce reading anxiety and improve students' reading comprehension skills.

Chen and Wang (2024) used an explanatory sequential mixed-method approach to investigate the characteristics and causes of Foreign Language reading Anxiety (FLRA) in 60 Chinese senior high EFL students. The

Foreign Language Reading Anxiety Scale (FLRAS) was used to gather quantitative data, and SPSS was used for analysis. The results showed that 78.33% of students had low FLRA (M=2.57). Qualitative analysis identified four main categories of FLRA sources: reading interest, self-expectation, reading strategies, and prior knowledge examples of individual factors. Topic, task type, text length, vocabulary, grammar, text structure, and rhetoric are examples of textual factors. Teaching methods and evaluation are examples of instructional factors. Peer pressure, teacher-student dynamics, and parental expectations are examples of situational factors. The researchers suggested giving vocabulary training top priority, putting interventions like the flipped classroom model into practice, and highlighting the importance of text structure and rhetorical techniques in FLRA. Additionally, they recommended statistical analysis of FLRA sources, investigation into the universality and language-specificity of FLRA causes, and more research on the FLRA profile of Chinese EFL learners.

Rezai et al. (2024) conducted a case study to examine the effectiveness of active learning strategies in enhancing motivation, reducing anxiety, and shaping positive attitudes among EFL learners. A Quasi-experimental, mixed-method design was conducted at the Iran Language Institute with 51 pre-intermediate Iranian EFL students randomly assigned to an experimental group (n = 26) and a control group (n = 25). The experimental group was taught through active learning techniques such as group discussions, role-play, and inquiry-based tasks, while the control group received traditional lecture-based instruction. Motivation scale, learning attitude questionnaire, and reading anxiety measurement were used to analyze the data. The findings indicated that the active learning approach significantly decreased reading anxiety and increased learners' motivation and engagement. The researchers recommended integrating active learning techniques into EFL reading instruction to reduce anxiety and promote learner engagement.

Wang (2023) investigated the domain-specific manifestation of foreign language tolerance of ambiguity (FLTA) among Chinese EFL learners. A quantitative analytical method was used, involving 795 university students learning English as a foreign language. A 20-item Foreign Language Tolerance of Ambiguity scale was developed, targeting five linguistic domains (semantic, phonological, morphosyntactic, thematic, and pragmatic) and four subtypes of ambiguity (novelty, complexity, insolubility, and incomprehension). Exploratory and confirmatory factor analyses were conducted to validate the scale, along with multiple regression analyses to examine its predictive power. The results indicated that domain-specific FLTA was a stronger predictor of language proficiency than general TA measures, explaining 3.7% of the unique variance beyond the general model. The study concluded that broad, general measures of ambiguity tolerance may overlook important domain-specific variations. The researcher recommended that applied linguistics research adopt more targeted tools when investigating the role of cognitive style in language learning.

Among Palestinian tenth-grade students, Eid (2022) investigated how well the KWL technique improved reading self-efficacy beliefs, decreased reading anxiety, and improved English critical reading skills. A quasi-experimental design was employed, involving 80 students from Masqat Secondary School. Students were split into two groups at random: one that received instruction using the KWL strategy and the other that received instruction using traditional methods. A reading anxiety questionnaire, reading self-

efficacy questionnaire, and a critical reading abilities test were the three tools utilized.

The results showed that the KWL strategy significantly improved the experimental group's critical reading skills and self-efficacy beliefs while reducing their reading anxiety. Based on these results, the researcher suggested using the KWL approach to teach Palestinian learners critical reading abilities in English.

Bensalem (2020) looked into Foreign Language Reading Anxiety (FLRA) in Saudi Arabian EFL students at the tertiary level. Using a quantitative approach, the study sampled 100 students from Northern Border University enrolled in an EFL program. The foreign Language Reading Anxiety Scale (FLRAS) was used to gather data, and correlation analysis and descriptive statistics were used for analysis. The results showed that a large number of students had moderate to high FLRA language barriers, a fear of making mistakes, insecurity, and the detrimental effects of anxiety on reading performance were all contributing factors. Poorer reading results were associated with higher anxiety levels.

Qaddomi (2013) conducted a study aiming to investigate the level of English learning anxiety among students at Al-Quds Open University and to explore whether gender or academic level influenced this anxiety. The researcher used a descriptive quantitative approach and selected a random sample of 52 students. The main tool used was Horwitz's (1986) Foreign Language Classroom Anxiety Scale (FLCAS), which measured domains such as communication apprehension, fear of negative evaluation, test anxiety, and general classroom anxiety. The statistical analysis was conducted using SPSS, and the reliability of the instrument was tested using Cronbach's Alpha, which yielded a reliability coefficient of 0.76.

The results indicated a medium level of anxiety overall, with higher anxiety among female students, especially in classroom interaction. No significant differences were found in anxiety levels based on students' academic level. The study concluded that EFL learners at QOU experience noticeable anxiety, particularly related to speaking and communication with native speakers. The study recommended creating a supportive learning environment, avoiding negative evaluation, and integrating speaking-focused activities and guest speakers to reduce learners' anxiety and promote communication confidence.

Findings indicated that many learners experienced moderate to high levels of FLRA. Contributing factors included linguistic difficulty, fear of making mistakes, lack of confidence, and the negative impact of anxiety on reading performance. Higher anxiety levels were linked to poorer reading outcomes. The researcher recommended adopting strategies to reduce classroom anxiety, such as fostering a supportive environment, using pre-reading activities to address linguistic challenges and boost confidence, and training teachers to identify and mitigate reading anxiety through targeted interventions.

Naqeeb & Awad (2011) investigated the perceived language learning styles among EFL students at the English Language Center at the Arab American University – Jenin, Palestine. The study employed a descriptive analytical approach using a structured questionnaire adapted from Oxford's (1990) learning style framework. The sample consisted of 150 male and female university students enrolled in English language courses. The questionnaire measured students' preferences for visual, auditory, kinesthetic, group, and individual learning styles.

Data analysis involved calculating means, standard deviations, and using t-tests and ANOVA to examine differences across gender and academic level. The findings revealed that

auditory learning was the most preferred style among students, followed by visual and group learning. Female students showed a significantly higher preference for group and visual learning styles compared to males. The study highlighted the diversity of cognitive learning styles among EFL learners and emphasized the importance of adapting teaching strategies to suit these individual differences. The researchers concluded that acknowledging learners' cognitive styles in instructional design could enhance language acquisition and reduce learning-related anxiety. They recommended incorporating varied active learning strategies that align with students' preferred styles to improve engagement and comprehension in EFL contexts.

Based on what was presented in previous studies, the researcher can briefly comment as follows:

– The scarcity of Arab studies that focused on studying the effect of the POSSE and Instructional Scaffolding strategies in reducing reading anxiety, such as the study of Eid (2022), in addition to not implementing Cognitive style to identify EFL learner, who can tolerance of ambiguous reading texts and who has no capacity to tolerance of ambiguous reading texts.

– The present study agreed with most previous studies in conducting the experimental approach as in the studies: Hafiza et al. (2024), Chen and Wang (2024), Eid (2022), and Bensalem (2020).

– In terms of the study tools, the current study agreed with most previous studies in adopting the (FLRAS) scale as one of the study tools as in the studies: Chen and Wang (2024), Zhou (2024), Rezai et al. (2024), and Bensalem (2020).

Methodology

In order to gather data, the researcher used a quantitative approach and an experimental design called the factorial design (2x2). The study involved 72 participants, divided equally into two experimental groups (36 participants per group). In Parallel, the POSSE strategy was used to teach reading skills to the first experimental group. The Instructional Scaffolding strategy was used to teach reading skills to the second experimental group. Both experimental groups underwent the English as a Foreign Language Tolerance-Intolerance of Ambiguity Scale (EFLTIAS) and the Foreign Language Reading Anxiety Scale (FLRAS) before the intervention. The reading materials included the prescribed book for Reading Skills at the university and five additional validated reading comprehension texts. These materials were reviewed and approved by university professors and specialized experts in the English Language Department. The treatment aimed to reduce reading anxiety through active learning strategies by teaching reading skills.

First Experimental Group (POSSE Strategy)

– Students were taught using the five phases of the POSSE strategy: predict, organize, search, summarize, and evaluate.

– Each phase included three different reading strategies: pre-, while-, and post-reading.

– Key reading comprehension skills were implemented, including previewing, predicting, identifying the main ideas and supporting details, making inferences, and summarizing.

– Students were taught new vocabulary, answered comprehension questions, completed in-class tasks to check understanding, and participated in discussions of reading topics.

Second Experimental Group (Instructional Scaffolding Strategy)

– Students were taught using the five phases of the Instructional Scaffolding strategy: Show and Tell, Using Visuals, Give Time to Talk, Asking for Completion, and Simplifying the Language.

– Each phase included three different reading strategies: pre-, while-, and post-reading.

– Similar to the first group, key reading comprehension skills (previewing, predicting, finding main ideas and supporting details, summarizing) were implemented, and students engaged in tasks such as learning new vocabulary, answering comprehension questions, and discussing reading topics.

After three months of intervention, both groups completed the post-*EFLTIAS* and post-*FLRAS* scales to measure their cognitive style and reading anxiety levels as outcomes of the experimental treatment. The treatment lasted for 36 instructional sessions conducted during the university's summer semester from July 2024 to September 2024. Institutional approval and participants' informed consent were obtained before starting the study.

Population of the Study

In the initial stages of the current study, the researcher started to experiment at Al-Azhar University in the Gaza Strip. However, due to the ongoing conflict and the devastating impact of the war, including the bombing of university buildings in Gaza, the researcher was compelled to shift the study's location. As a result, the experiment was carried out with a sample from the Arab American University (AAUP) -Jenin in the West-Bank, Palestine. This adjustment was made to ensure the continuity of the research under circumstances that were beyond the researcher's control. Despite these challenges, the study proceeded with full academic integrity, maintaining the

focus and objectives of the original study design .

All EFL first-level English freshmen majors enrolled in the Faculty of Art and Education's reading skills (I) course during the summer semester of the academic year 2023-2024 at (AAUP) University made up the study's population. Seventy-two male and female students made up the study's total population.

Study Sample

The sample of the study includes 72 freshmen English majors of Faculty of Art and Education in the Arab American University (AAUP) -Jenin in the West-Bank, Palestine. These students enrolled in the reading skills (I) course during the summer semester of 2023-2024. The researcher randomly selected the first experimental group and the second experimental group by lottery. Students' number in the first experimental group was 36 students, while the number of students in the second experimental group was 36. They are between 18-19 years old. Due to the vast number of 1st level students, the study was chosen at random.

Study Materials

The researcher designed the study materials to reveal the impact of the interaction between active learning strategies (POSSE, Instructional Scaffolding) and cognitive style (Tolerance-Intolerance of Ambiguity) in reducing reading anxiety. These tools include:

1. The Foreign Language Reading Anxiety Scale (FLRAS).

2. The English as a Foreign Language Tolerance-Intolerance of Ambiguity Scale (EFLTIAS).

3. A Teacher Guide.

The First Tool: English as a Foreign Language Tolerance-Intolerance of Ambiguity Scale (EFLTIAS)

By reviewing educational literature and previous studies like Erten and Topkaya (2009), Basoz (2015) and Nezhad, Atarodi, and Khalili (2013), the researcher created a specific scale called English as a Foreign Language Tolerance – Intolerance of Ambiguity (EFLTIAS) to examine the efficacy of the interaction between active learning strategies (POSSE and Instructional scaffolding) and cognitive style (Tolerance/intolerance of ambiguity) in reducing reading anxiety. There were twenty items on the EFLTIAS scale, which was developed as a questionnaire with a four-point Likert scale. Four points were awarded for "Strongly Disagree", three for "Disagree", two for "Agree", and one for "Strongly Agree" for positive assertion. The weights for negative statements were inverted.

By presenting the scale to panel arbitrators, experts, and educational supervisors with backgrounds in psychology, measurement and assessment, and English Language, the scale's face validity was guaranteed. The (EFLTIAS) scale was updated and finalized in response to the evaluators' suggestions and remarks, as indicated in Appendix (1). After applying the motivation scale to the students, the researchers calculated the reliability coefficient using the Spilt-half coefficient (0.945) and Cronbach's Alpha for the scale items, which was found to be (0.918) a value that is educationally acceptable for achieving the study's objectives (Hasan, 2020).

The Second Tool: Foreign Language Reading Anxiety Scale (FLRAS)

By reviewing educational literature and previous studies like Chen and Wang (2024), Zhou (2024), and Bensalem (2020), the researcher created a particular scale called the Foreign Language Reading Anxiety (FLRAS) Scale to suites the objectives. These include determining the efficacy of the interaction between active learning strategies (POSSE and Instructional scaffolding) and cognitive style (Tolerance/intolerance of ambiguity) in reducing reading anxiety. Therefore, this scale was created by the researcher to gauge students' reading anxiety. The scale consists of (4) dimensions, Cognitive, Behavioral, Emotional and Physical aspect. There are (34) Statements in all and statement (1) though (34) discuss the examinee's feelings regarding reading in English. There is a five-point graded scale in front of these remarks. Mark the corresponding number in the line that follows each sentence to indicate whether you (1) strongly disagree, (2) disagree, (3) neutral, (4) agree, or (5) strongly agree. From these points, which range from total agreement to total opposition, the examinee must select what he believes is appropriate. The greater score indicates a tendency towards reading anxiety.

By presenting the scale to a panel of arbitrators, experts and educational supervisors with backgrounds in psychology, measurement and assessment and English Language, the scale's face validity was guaranteed. The (FLRAS) scale was updated and finalized in response to the evaluators' suggestions and remarks, as indicated in Appendix (2).

Using the Spilt-half coefficient (0.934) and Cronbach's Alpha for the (FLRAS) scale items, the researcher determined the reliability coefficient after administering the motivation scale to the students. The result was (0.872), which is deemed educationally acceptable for accomplishing the study's objectives (Hasan, 2020).

The Third Tool: Teacher Guide

In order to identify the tools that can be used to help teachers implement an educational program that focuses on improving students' reading skills in order to reduce reading anxiety by applying such effective strategies, the researcher reviewed the content of the reading skills course book intended for first-level English language students at the university. Additionally, the researcher reviewed previous studies and research related to POSSE and Scaffolding in developing reading skills. Based on cognitive perspective, the teaching guide considers whether or not student can tolerate uncertainty.

Learning Objectives

1. **Developing Basic Reading Skills**
   – Enabling students to preview and predict text content (Preview & Predict).
   – Helping students identify main ideas and supporting details in texts (Main Idea & Supporting Details).
   – Enhancing inferential thinking skills (Inference).
   – Improving the ability to summarize texts (Summarizing).

2. **Reducing Reading Anxiety**
   – Creating a supportive learning environment to reduce tension while reading.
   – Building students' confidence when dealing with new texts.

3. **Enhancing Tolerance of Ambiguity**
   – Teaching students to confidently handle ambiguous or challenging texts.
   – Promoting cognitive flexibility and improving strategies for dealing with complex texts.

Reading Skills

1. **Preview:** Identifying titles and highlighted elements of the text.

2. **Predict:** Anticipating the content of the text using available information.

3. **Main Idea & Supporting Details:** Identifying key ideas and the elements supporting them.

4. **Inference:** Reading between the lines to understand implicit meanings.

5. **Summarizing:** Concisely summarizing the main ideas of a text.

Learning Activities

Pre-reading

1. **Introducing the Text:**
   – Presenting the title and illustrations of the text.
   – Discussing key or challenging vocabulary.

2. **Prediction:**
   – Open-ended questions such as: "What do you think this text is about?"
   – Writing predictions in a reading journal.

While-reading:

1. **Confirming Predictions:**
   – Reading the first paragraphs to check predictions.

2. **Finding Main Ideas:**
   – Highlighting main paragraphs and clarifying their details.

3. **Asking Questions:**
   – Inferential questions: "Why did the author say this?"
   – Analytical questions: "How do these details support the main idea?"

Post-reading:

1. **Summarizing:**
   – Writing a short summary of the text in five sentences.
   – Discussing summaries in groups.

2. **Reviewing:**
   - Comparing results with initial predictions.
   - Conducting interactive activities such as mind maps.

Suitable Teaching Aids

1. **Digital Aids:**
   - Slide presentation software.
   - Short educational videos.

2. **Paper-based Aids:**
   - Short texts and flashcards.
   - Graphic organizers.

3. **Interactive Aids**
   - Educational apps.
   - Smart boards.

Assessment

Formative Assessment
   - Observations during activities.
   - Short quizzes after each lesson.

Summative Assessment
   - Final exam to measure the five reading skills.
   - Surveys to measure changes in reading anxiety levels.

Teacher Guidelines
   - Gradual presentation of skills.
   - Encouraging positive student participation.
   - Providing continuous and constructive feedback.
   - Considering individual differences among students, especially in terms of their tolerance of ambiguity.

Statistical analysis

Statistical Package for Social Sciences (SPSS) was used to calculate and analyze the study quantitatively. The following statistical tools were used:

1. A two-way analysis of variance (ANOVA) was conducted to examine the interaction effect between the use of active learning strategies and cognitive style on reducing reading anxiety. The results indicated no statistically significant interaction, with an F value of 0.411 and a significance level of 0.524.

2. A paired-sample T-test was conducted to examine the differences between the pre- and post-test scores on the reading anxiety scale for both groups; the results revealed statistically significant differences for the first group using the POSSE strategy (T = 11.032, Sig. = 0.000) as well as for the second group using the Scaffolding strategy (T = 11.052, Sig. = 0.000).

3. The Eta-squared coefficient was calculated to determine the effect size of each aspect of the Reading Anxiety Scale for both groups. The results indicated a strong effect size in both the POSSE strategy group (t = 11.032, $\eta^2 = 0.777$) and the Instructional Scaffolding strategy group (t = 11.052, $\eta^2 = 0.777$).

4. Cronbach's Alpha was employed to assess the internal consistency and reliability of the instruments used in the study. The EFLTIAS scale yielded a high reliability coefficient of 0.918, while the FLRAS scale demonstrated a reliability coefficient of 0.872, both indicating strong internal consistency.

5. The reliability of the EFLTIAS and FLRAS scales was assessed using the Spearman-Brown split-half method. The split-half reliability coefficient was (0.945) for the EFLTIAS scale and (0.934) for the FLRAS scale, indicating a high level of internal consistency for both instruments.

Study Results and Discussion

Answer of the First Question

The First question states: **"What is theoretical framework that underpins the interaction between active learning**

strategies (POSSE and Instructional Scaffolding) and cognitive style (tolerance/ intolerance of ambiguity) in reducing EFL learners' reading anxiety?"

The researcher reviewed the academic literature related to the subject of the study, including books, refereed journals, references, educational research, and previous studies, in order to answer the first question. As a result, the researcher did her best to enumerate the study's main themes and subjects. The study's theoretical framework is founded on a number of interconnected hypotheses that describe how active learning strategies and cognitive styles interact to improve reading comprehension and lessen reading anxiety in English as Foreign Language (EFL) learners. As stated in the theoretical framework, this framework incorporates the theories of reading anxiety, active learning, and cognitive style, particularly

tolerance of ambiguity. Thus, the study's initial question has been addressed by the researcher.

Answer of the Second Question

The Second question states: **"Is there an effect of the interaction between the two strategies of active learning (POSSE and Instructional Scaffolding) and Cognitive Style (tolerance/intolerance of ambiguity) on reducing reading anxiety among EFL learners?,"**. To answer the second question, the researcher formulated the following null hypothesis: **"There are no statistically significant differences at the significance level (a<=0.05) in reducing reading anxiety among students attributed to the interaction between the strategies (POSSE, Scaffolding) and ambiguity (tolerance of ambiguity / intolerance of ambiguity)".**

A Two-Way ANOVA test was employed to confirm the validity of this hypothesis; Table (1) shows the results.

Table (1): Results of the Two-Way ANOVA between the use of Active Learning Strategies (POSSE, Scaffolding) and Cognitive Style (tolerance / intolerance of ambiguity) on reducing reading anxiety

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Active Learning (POSSE, Scaffolding) strategies	0.176	1	0.176	1.306	0.257
Cognitive Style (tolerance/ intolerance of ambiguity)	0.051	1	0.051	0.379	0.540
Active Learning * Cognitive Style	0.055	1	0.055	0.411	0.524
Error	9.161	68	0.135		
Total	1302.434	72			

Table (1) shows there are no statistically significant differences in reducing reading anxiety of the students attributable to the strategy (POSSE, Scaffolding); the F value =1.306 and the Sig value =0.257, which are statistically non-significant.

There are no statistically significant differences in reducing reading anxiety of the students attributable to Cognitive style (tolerance of ambiguity / intolerance of ambiguity); the F value =0.379 and the Sig

value =0.540, which are statistically non-significant.

There are no statistically significant differences in the reducing reading anxiety of the students attributable to the interaction between the Active Learning strategies and cognitive Style; the F value = 0.411 and the Sig value =0.524, which are statistically non-significant.

Based on the absence of statistically significant differences (a <= 0.05) between the first experimental group (which used POSSE

strategy) and the second experimental group (which used Scaffolding strategy), the researcher proceeded to study the differences before and after the experiment for each group. The researcher formulated the following null hypothesis:

There are no statistically significant differences at the significance level (a <= **0.05) between the mean scores of the students in reducing reading anxiety between the pre-test and post-test for the first experimental group (which used POSSE strategy).**

To verify the validity of this hypothesis, the "Paired samples T-test" was used, see table (2).

Table (2): Means, standard deviations, t-value and significance level to identify the differences between the Means of the students' scores in the pre-post reading anxiety Scale for the First Group who used POSSE strategy.

Scope	First Group (POSSE)	N	Mean	Std. Deviation	T	Sig. value	Sig. level
Cognitive Aspect	Pre test	36	3.271	0.514	7.555	0.000	sig. at 0.01
	post test	36	4.226	0.493			
Behavioral Aspect	Pre test	36	3.201	0.888	8.278	0.000	sig. at 0.01
	post test	36	4.469	0.314			
Emotional Aspect	Pre test	36	3.331	0.587	6.530	0.000	sig. at 0.01
	post test	36	4.186	0.534			
Physical Aspect	Pre test	36	3.111	0.621	8.769	0.000	sig. at 0.01
	post test	36	4.226	0.533			
SUM	Pre test	36	3.234	0.444	11.032	0.000	sig. at 0.01
	post test	36	4.271	0.362			

"t" table value at (35) d f. at (0.05) sig. level equal 2.03
"t" table value at (35) d f. at (0.01) sig. level equal 2.72

Table (2) shows that: The calculated "t" value is greater than the table "t" value at all levels and the total test score at a significance level of (a <= 0.05).This indicates statistically significant differences between the pre-test and post-test mean scores on the reading anxiety scale for the first experimental group (POSSE Strategy), in favor of the post-test. Consequently, the null hypothesis, stating that "there are no statistically significant differences at (a <= 0.05) between the pre-test and post-test for the first experimental group (POSSE Strategy)", is rejected.

The researcher calculated the size of the effect according to the following equation:

$$\eta^2 = \frac{t^2}{t^2 + df}$$

And "d" value using the following formula:

$$D = \sqrt{\frac{2t}{df}}$$

Table (3): The Table References to Determine the Level of Size Effect (η^2) and (d).

Test	Effect volume		
	Small	Medium	Large
η^2	0.01	0.06	0.14
D	0.2	0.5	0.8

The researcher calculated the size of the effect of the (POSSE Strategy) on the (**reading Anxiety Scale**), See table (4): shows the size of the effect by each of reading anxiety scale:

Table (4): The Effect Size of each of Aspect of reading Anxiety Scale for the First Group who studied POSSE Strategy

Skill	t value	η^2	d	Effect volume
Cognitive Aspect	7.555	0.620	1.242	Large
Behavioral Aspect	8.278	0.662	1.3608	Large
Emotional Aspect	6.530	0.549	1.0735	Large
Physical Aspect	8.769	0.687	1.4416	Large
Total	11.032	0.777	1.8136	Large

Based on the reference table (3), it is clear from table (4) that the effect size was large, and this indicates that the use of a strategy had a significant effect on reducing reading anxiety.

This result can be attributed to the fact that this strategy provides an organized support structure that enables students to handle and comprehend various texts through the following aspects:

1. **Cognitive Aspect**: The POSSE strategy enhances students' cognitive skills by helping them identify and summarize main ideas, increasing focus and awareness in text comprehension. This builds confidence in their abilities, reducing anxiety from misunderstandings. Additionally, the guidance provided minimizes hesitation and psychological pressure, alleviating concerns about guessing answers or struggling with comprehension.

2. **Behavioral Aspect**: The POSSE strategy promotes active engagement in reading, encouraging students to interact with texts and follow clear steps, which enhances reading proficiency and reduces behavioral anxiety. Its gradual and structured approach fosters confidence and willingness to participate in reading activities without pressure.

3. **Emotional Aspect**: POSSE strategy reduces anxiety by offering support and guidance, boosting students' confidence in handling complex texts, and easing tension through a sense of shared effort, enabling stress-free reading.

4. **Physical Aspect**: The POSSE strategy enhances students' comfort and confidence, reducing physical anxiety symptoms like tension, while providing structured opportunities to engage with texts, easing fear of misunderstanding.

Moreover, the researcher formulated the following null hypothesis: **There are no statistically significant differences at the significance level (a <= 0.05) between the mean scores of the students in reducing reading anxiety scale between the pre-test and post-test for the second experimental group (which used Scaffolding strategy).**

To verify the validity of this hypothesis, the researcher used "Paired samples T-test". See table (5).

Table (5): Means, standard deviations, t-value and significance level to identify the differences between the Means of the students' scores in the pre and post reading anxiety Scale for the Second Group who used Scaffolding strategy

Scope	Second Group (Scaffolding)	N	Mean	Std. Deviation	t	Sig. value	sig. level
Cognitive Aspect	Pre test	36	3.375	0.549	6.575	0.000	sig. at 0.01
	post test	36	4.184	0.438			
Behavioral Aspect	Pre test	36	3.319	0.743	6.887	0.000	sig. at 0.01
	post test	36	4.333	0.412			
Emotional Aspect	Pre test	36	3.286	0.485	7.857	0.000	sig. at 0.01
	post test	36	4.192	0.473			
Physical Aspect	Pre test	36	3.066	0.479	8.904	0.000	sig. at 0.01
	post test	36	4.160	0.527			
SUM	Pre test	36	3.263	0.366	11.05	0.000	sig. at 0.01
	post test	36	4.216	0.349			

"t" table value at (35) d f. at (0.05) sig. level equal 2.03
"t" table value at (35) d f. at (0.01) sig. level equal 2.72

Table (5) indicates that there are significant differences in reducing reading anxiety between the pre-test and post-test for the second experimental group (Scaffolding Strategy), in favor of the post-test. The calculated "t" value is greater than the table "t" value at a significance level of (a ≤ 0.05), leading to the rejection of the null hypothesis.

The researcher calculated the size of the effect of the (Scaffolding Strategy) on the (reducing reading anxiety scale), see table (6):

Table (6): The Effect Size of each Aspect in Reading Anxiety Scale for the Second Group who studied Scaffolding Strategy.

Skill	t value	η^2	d	Effect volume
Cognitive Aspect	6.575	0.553	1.081	Large
Behavioral Aspect	6.887	0.575	1.132	Large
Emotional Aspect	7.857	0.638	1.292	Large
Physical Aspect	8.904	0.694	1.464	Large
Total	11.052	0.777	1.817	Large

Based on the reference table (3), Table (6) shows a large effect size, highlighting the significant impact of the Scaffolding Strategy in reducing reading anxiety. This is attributed to the strategy's gradual support and its role in building students' confidence and ease in reading texts. This result can be explained according to the following aspects:

1. **Cognitive Aspect**: The Scaffolding strategy improves text comprehension by dividing it into smaller, manageable sections, reducing confusion and pressure, and boosting students' self-confidence.

2. **Behavioral Aspect**: The Scaffolding Strategy promotes gradual participation in reading activities, starting with simple concepts and progressing to complex ones, encouraging engagement and reducing avoidance behaviors**.**

3. **Emotional Aspect**: The Scaffolding Strategy creates a supportive environment that boosts self-confidence, reduces tension, and alleviates reading anxiety by allowing students to learn from mistakes and feel more at ease.

4. **Physical Aspect**: The Scaffolding Strategy reduces stress and anxiety by gradually increasing text difficulty, preventing physical symptoms like exhaustion and difficulty concentrating.

Unexpectedly, the findings of the current study revealed no statistically significant interaction between the active learning strategies (POSSE and Scaffolding) and cognitive style (tolerance vs. intolerance of ambiguity) in reducing students' reading anxiety. This result may be attributed to several factors:

1. **The Independent Effect of Each Variable:** it is possible that both the learning strategy and cognitive style contributed to reducing reading anxiety independently, without producing a synergistic or multiplicative effect. This suggests that the benefits of each variable may not be conditional upon the other.

2. **The Nature of Cognitive Style:** cognitive style -especially tolerance or intolerance of ambiguity-is generally considered a stable psychological trait that may not easily shift during short-term instructional interventions. Therefore, students' responses to instructional strategies might have varied based on their cognitive preferences, but not to a statistically meaningful degree.

3. **Duration of the Intervention:** The intervention lasted only three months through the summer semester, which might not be sufficient to generate significant interaction effects on affective variables such as anxiety, which often require long-term periods of intervention and deep-seated attitudes.

4. **Sensitivity of the Measurement Tool:** The reading anxiety scale used might not have been sensitive enough to detect nuanced changes in how cognitive style interacted with the instructional strategies, particularly if the changes were moderate or uneven across participants.

5. **Homogeneity in the Sample:** the sample might have been relatively homogeneous in terms of cognitive style distribution,

reducing the statistical variability required to detect an interaction.

Taken together, these findings suggest that while POSSE and Scaffolding are effective in reducing reading anxiety, their impact does not appear to differ significantly according to the learner's tolerance of ambiguity. Thus, the researcher highlights the need for more nuanced instructional design, perhaps incorporating personalized scaffolds or longer-term interventions for students with low ambiguity tolerance.

The researcher concludes that this study offers a valuable contribution to the educational literature on active learning, demonstrating its role in alleviating reading anxiety among EFL learners. It underscores the need for instructional approaches that are responsive to learners' cognitive styles and affective needs, particularly within culturally sensitive educational contexts.

Recommendations

The report makes the following recommendations in light of its findings:

– Including modern learning strategies in EFL curricula and studying the interaction with contemporary educational trends such as self-directed learning and distance learning, and how this affects reducing reading Anxiety.

– Conducting descriptive studies to assess the extent to which teachers adopt instructional strategies that take into account individual differences among students and focus on blended learning with support and guidance.

Future Studies

– A study of the impact of strategies in different educational contexts and in diverse learning environments such as: (online education or traditional education) and among different age or cultural groups.

– Conducting other experimental studies that include modern learning strategies such as active learning strategies, and studying the interaction with contemporary educational trends such as self-directed learning and distance learning, and how this affects other language skills such as writing and listening.

– Conducting longer-term interventions, integrating more diverse learner profiles, and utilizing highly sensitive affective measures to examine potential interaction effects with greater precision.

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