



Achievement emotions: Their relationship with academic performance and learning styles in EFL learners

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I have no known conflict of interest to disclose.

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Abstract

This study examines the relationship of achievement emotions to academic performance and to learning styles in English as a Foreign Language (EFL) learners, a largely unexplored area of research. Employing a quantitative research design, 300 participants from the Applied College at a public university completed an adapted version of the Achievement Emotions Questionnaire-Short (AEQ-S) by Bieleke et al. (2021). This instrument assessed emotional experiences across classroom-related, testing-related, and self-directed learning contexts. Kruskal-Wallis tests identified significant differences in emotional experiences between high- and low-achieving students across the three contexts, with high achievers experiencing heightened positive emotions and low achievers, negative ones. Moreover, there was variation in experiences of achievement emotions across the different academic settings for all achievement levels, highlighting the need for context-sensitive teaching strategies. ANOVA further demonstrated that learners' distinct learning styles significantly influenced experiences of achievement emotions with the exception of *anxiety* and *relief*, indicating that adaptation of instructional methods to learning styles can play a crucial role in shaping students' emotional responses. These findings may offer insights for developing emotionally responsive pedagogical strategies, ultimately enhancing academic success among EFL students.

Keywords: achievement emotions; EFL learning; academic performance; learning styles; control-value theory.

Achievement Emotions: Their Relationship to Academic Performance and to Learning Styles in EFL Learners

Recent research has increasingly highlighted the pivotal role of achievement emotions, also known as academic emotions, in second language (L2) learning, emphasising their profound influence on the dynamics and outcomes of L2 learning (Fan & Xu, 2018; Pan, 2022; Pekrun et al., 2017). Achievement emotions are defined as emotions related to achievement outcomes or achievement activities (Pekrun, 2006). What makes achievement emotions distinctive is their close association with students' assessments of success or failure and their active engagement in academic tasks, reflecting a complex interplay between emotional, motivational, and cognitive processes (Pekrun, 2019; Pekrun & Stephens, 2010; Putwain et al., 2018).

Positive achievement emotions, such as enjoyment of learning or pride in one's achievements, generally enhance cognitive functioning and persistence (Li & Wei, 2023; Shao et al., 2019). MacIntyre and Gregersen (2012) argue that positive achievement emotions facilitate language learning by enhancing language skills and promoting personal growth. Positive achievement emotions also drive behaviours that support learning, such as boosting self-efficacy, improving focus, and reducing defensiveness, all of which contribute to language development (MacIntyre & Vincze, 2017; Shao et al., 2019). However, Pekrun et al. (2017) warn that overreliance on positive emotions may reduce the effort learners invest in their studies.

On the other hand, negative achievement emotions, such as anxiety when taking exams or disappointment about unattainable learning goals, are typically seen as detrimental, as they can diminish motivation and disrupt the learning process (Pekrun, 2006; Rowe & Fitness, 2018). These achievement emotions are associated with reduced willingness to communicate in the target language (MacIntyre et al., 2003), interference with social-communicative aspects of L2 development (Dewaele, 2010), and lower academic achievement (Zeidner, 2014). However, recent research suggests that, in some cases, negative achievement emotions may have a facilitative effect. For example, Mendez-Lopez (2022) argues that achievement emotions like anger can enhance motivation by fostering an internal drive to overcome challenges in language learning.

Despite extensive research on the influence of achievement emotions on language learning outcomes (Starkey-Perret et al., 2017), little research has examined the relationship between achievement emotions and learning styles. Learning styles have been a significant area of L2 research, as individual differences in processing and engaging with language learning material can impact outcomes. Fleming's (2001) influential study on language learning styles categorised learners as visual, auditory, kinaesthetic, and tactile, suggesting that aligning instructional methods to these styles could enhance language acquisition. Additionally, Peacock (2001) found that mismatches between teaching methods and students' learning preferences could lead to reduced motivation and effectiveness in EFL learners.

This research gap is particularly notable in regions like Saudi Arabia, where studies on the emotional aspects of EFL learning are scarce (Alrabai, 2020). Research in these contexts has predominantly focused on cognitive and metacognitive strategies (Alhaisoni, 2012), with no attention given to the relationship of achievement emotions to academic performance and to learning styles (Al-Seghayer, 2021). To address these gaps, this study utilised a modified version of Bieleke et al.'s (2021) Achievement Emotions Questionnaire-Short (AEQ-S) to investigate the relationship of achievement emotions to academic performance across three academic settings (classroom, learning, and testing) and to learning styles among EFL learners in a Saudi tertiary context. The research questions guiding this study are:

- RQ1. How do achievement emotions assessed by the AEQ-S differ among EFL university students across classroom, self-directed learning, and testing contexts based on their academic performance levels?
- RQ2. What is the relationship between EFL students' preferred learning styles and their reported achievement emotions?

Literature Review

The Control-Value Theory of Achievement Emotions

Achievement emotions are among the most frequently experienced emotions in academic contexts (Pekrun, 2019). The Control-Value Theory (CVT) of achievement emotions, introduced by Pekrun (2006), provides a structured approach to understanding the role of emotions in academic performance. CVT posits that achievement emotions are shaped by two core appraisals: control (the perceived ability to manage a task) and value (the importance attached to the task or its outcomes). These emotions can be categorised by focus (activity- or outcome-related), valence (positive or negative), and activation (high or low arousal). For instance, enjoyment, a positive high-arousal emotion, is linked to tasks that are seen as both valuable and manageable, enhancing engagement and persistence (Pekrun & Perry, 2014). In contrast, boredom, a low-arousal negative emotion, arises when a task is deemed irrelevant or unchallenging, reducing motivation and cognitive engagement (Preckel et al., 2010). Anxiety, often outcome-focused, is triggered by the perception of high importance but low control over success, which can hinder academic performance (Li & Wei, 2023).

Achievement Emotions in EFL Contexts

EFL learners experience a wide range of achievement emotions that vary based on context and academic performance, among other factors. In a study conducted by Reilly and Rosas (2019) among EFL learners in Mexico, it was found that positive emotions such as pride, hope, and enjoyment were more intense than anxiety in academic settings. Similarly, a study by Piniel and Albert (2018) in Hungary explored the emotions of English majors both inside and outside the classroom. They found that language anxiety and enjoyment were the two most frequently experienced achievement emotions, and that these emotions varied depending on the context of language use (in class or outside class). However, none of these previous studies explore experiences of achievement emotions across different types of academic settings like studying, attending class, and taking exams and tests even though Pekrun et al. (2011) suggest that experiences of achievement emotions are likely to vary across these settings because they differ in regards to their social structures and functions. For example, enjoying the challenge of an exam may differ from enjoying classroom instruction because some students may be excited when attending, others when undertaking an exam.

Additionally, past studies have examined the association between achievement emotions and L2 achievement. For instance, Li and Wei (2023) used the CVT to study the independent, combined, and predictive effects of three emotions (enjoyment, anxiety, and boredom) on L2 achievement over time. Their study found that the three achievement emotions predicted later foreign language achievement over three-time points. Moreover, Tan (2017) classified L2 learners into three groups: surpasser, achiever, and underachiever. Tan (2017) found that achiever L2 learners exhibited more positive achievement emotions, while underachiever L2 learners had more negative achievement emotions.

Furthermore, some studies have suggested that engagement may be the principle of how achievement emotions influence academic outcomes. For example, the investigation of Wang

et al. (2023) noted that L2 learner's achievement emotions consisting of classroom anxiety, language enjoyment, and learning boredom predicted the learner's engagement in language learning, which ultimately affected their English achievement. Their findings mirror those of Quintero et al. (2022) and Kwon et al. (2018).

Learning Styles in L2 Contexts

Unlike learning strategies that are deliberately learned by students to engage in classroom activities (Wintergerst et al., 2003), learning styles are general, stable, and unrelated to the skills acquired in the classroom (Zhang et al., 2017). In EFL settings, learning styles are defined as "a student's preferred method or mode of learning" to absorb and process the foreign language (Peacock, 2001, p. 1). Reid's (1987) Perceptual Learning Style Preference Questionnaire (PLSPQ) is the pioneering classification instrument, identifying six learning styles: visual, auditory, kinaesthetic, tactile, as well as group and individual learning. While this framework provides a more detailed understanding of students' learning styles, it is also less practical for application in research settings. In 2001, Fleming introduced the Visual, Auditory, Reading/writing, and Kinaesthetic (VARK) learning styles framework. According to Fleming (2001), visual learners like to learn through images and different colours. Instead of relying on verbal cues, they are more likely to use the teacher's non-verbal cues such as body language (Gilakjani, 2012). Auditory learners learn by hearing about topics from their teachers or fellow students. Read/write students tend to learn by making notes, writing essays, and reading textbooks, among other approaches. Kinaesthetic students like to learn through empirical activities like trips and hands-on activities.

Research has investigated the link between learning styles and EFL instruction, focusing on their alignment (Peacock, 2001; Toyama & Yamazaki, 2020). These studies have been motivated by the notion that EFL teachers can maximise learning outcomes by using situations that match students' learning styles (Wintergerst et al., 2003). However, only a few publications have investigated the relationship between learning styles and achievement emotions. In their literature review, Huber and Muller (2023) suggest that achievement emotions moderate the extent to which the correct learning channel aligns with learning styles to improve L2 outcomes. Some scholars have focused on the interplay between specific emotions and learning styles. For example, Bailey et al. (1999) found that language anxiety is moderated by learning styles among college-level L2 students, although the correlation was weak. Simpson and Du (2004) demonstrated that learning styles explain students' enjoyment levels among distance learners. None of these studies compares a set of achievement emotions and their interplay effects with learning styles.

In summary, while previous studies have examined the interplay between achievement emotions and academic performance, the relationship of achievement emotions to academic performance across different academic settings and to learning styles among L2 learners remains largely unexplored.

Methods

Participants

Study participants were EFL university students enrolled in the second semester general English language course, a mandatory course every semester in the first year of their two-year applied diploma program. The course focuses on reading, writing, listening, and speaking skills, and the syllabus is based on the books *Unlock Level 1* and *Unlock Level 2* from the Cambridge University Press. Additionally, it follows a traditional English teaching approach, emphasising structured lessons, teacher-led instruction, and textbook-based learning. Students' English

proficiency ranged from intermediate to upper-intermediate, as determined by a placement test administered by the English Language Centre at the university prior to their admission. While most had studied English in secondary school, their confidence and proficiency in academic and professional communication varied. A stratified random sample of 300 students was selected to participate in the study from the initial pool of 422 students enrolled in the course to ensure representation of diverse academic achievement levels based on overall grade in the first semester general English language course and demographic characteristics, as prior research shows that achievement emotions can vary by factors such as self-esteem, gender, and age (Chen, 2024; Starkey-Perret et al., 2017). Participation in the study was entirely voluntary, and all students were informed about the purpose of the research, the nature of their involvement, and their right to withdraw at any point without negative consequences. Table 1 provides a summary of the participants’ demographic and academic characteristics.

Data Collection

To measure achievement emotions, Pekrun et al. (2011) developed the Achievement Emotions Questionnaire (AEQ), informed by the principles of the CVT. The AEQ is validated in numerous studies and is widely used in academic settings (Pekrun et al., 2011). The instrument offers comprehensive conceptual coverage that allows researchers to explore emotions across various learning contexts (Pekrun et al., 2011; Reilly & Rosas, 2019). It includes 24 scales measuring nine key emotions—joy, hope, pride, relief, anger, anxiety, shame, despair, and boredom—across three academic contexts: classroom, learning, and testing. Although the AEQ’s 232 items make it a thorough tool for evaluating achievement emotions, its length can be a practical limitation, especially in large-scale studies, due to the time required for administration (Bieleke et al., 2021). To address these challenges, Bieleke et al. (2021) developed the AEQ-Short, a more concise version with 96 items. The AEQ-Short retains the ability to assess achievement emotions effectively across key academic contexts—learning, testing, and classroom—while maintaining high reliability and validity (Shao et al., 2023).

Table 1 Descriptive statistics of participants

Category	Subcategory	Female number	Female percentage	Male number	Male percentage	Total number	Total percentage
Gender	Female/Male	184	61.3%	116	38.7%	300	100.0%
Learning styles	Auditory	38	70.4%	16	29.6%	54	18.0%
	Kinaesthetic/Tactile	13	59.1%	9	40.9%	22	7.3%
	Read/Write	55	55.6%	44	44.4%	99	33.0%
	Visual	78	62.4%	47	37.6%	125	41.7%
Overall grade in the semester one general English language course	A	43	57.3%	32	42.7%	75	25.0%
	A+	20	62.5%	12	37.5%	32	10.7%
	B	45	60.8%	29	39.2%	74	24.7%
	B+	36	57.1%	27	42.9%	63	21.0%
	C	29	70.7%	12	29.3%	41	13.7%
	F	11	73.3%	4	26.7%	15	5.0%

Data for this study were collected using an adapted version of the AEQ-S, along with an additional demographic section included in the survey. This adapted version comprised 98 Likert-scale items organised into 25 subscales, measuring nine distinct achievement-related emotions across three academic contexts mentioned previously above. To maintain contextual relevance, the phrase “English course” was incorporated into the scale items. Participants rated each item on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree), providing a detailed and context-specific view of their emotional experiences. A demographic section was added to the AEQ-S to collect essential background information, including (1) Age, (2) Years of English instruction, (3) Overall grade in the semester one general English language course, and (4) Preferred learning style. These demographic variables offered valuable context for interpreting students’ achievement emotions and find possible answers to the research questions.

Data Analysis

All analyses were conducted using SPSS software (version 26). Descriptive statistics were employed to map the distribution of achievement emotions across different academic settings. As the ordinal data did not conform to normality assumptions, the Kruskal-Wallis test was used in place of analysis of variance (ANOVA) to identify variations in emotions associated with academic outcomes across different academic contexts. Additionally, the relationship between preferred learning styles and reported achievement emotions was examined using ANOVA. This was followed by post hoc analyses, specifically Tukey’s HSD test, to pinpoint particular learning styles that corresponded to distinct emotional experiences. Throughout the analysis, rigorous adherence to statistical assumptions was maintained. Normality was assessed using both the Shapiro-Wilk test and Q-Q plots, while Levene’s test was conducted to ensure homogeneity of variances. This comprehensive, multi-faceted analytical approach offered a nuanced view of the emotional dynamics at play in EFL learning, contributing to a deeper understanding of the affective factors influencing L2 acquisition.

Results

Achievement Emotions Across Different Academic Settings Based on Academic Performance Levels (RQ1)

Class Setting

To address the first research question, a series of Kruskal-Wallis tests were conducted to examine the variations in achievement emotions across different grade levels in the classroom setting (see Table 2). For enjoyment, significant variation was observed across grade levels, $\chi^2(5) = 19.39$, $p = .002$. Students at both ends of the grading spectrum reported higher levels of enjoyment, with A+ students (Mean Rank = 177.71) and F students (Mean Rank = 166.97) having the highest ranks. This result indicates that enjoyment is not uniformly distributed across grades and may be influenced by factors unique to these performance groups. Furthermore, *hope* showed significant differences among grade levels, $\chi^2(5) = 19.05$, $p = .002$. Students with C grades reported the highest levels of hope (Mean Rank = 174.00), closely followed by A+ students (Mean Rank = 172.91). These results suggest that hope may reflect diverse motivational or aspirational states within these groups. For *pride*, significant variations were noted, $\chi^2(5) = 18.29$, $p = .003$. A+ students reported the highest levels of pride (Mean Rank = 174.49), with a general trend of increasing pride as grades improved.

Among the negative emotions, *anger* demonstrated significant differences across grade levels, $\chi^2(5) = 25.15$, $p < .001$. F students reported the highest levels of anger (Mean Rank = 208.73), followed by B students (Mean Rank = 179.86). This pattern may reflect frustration or

Table 2 *The association between achievement emotions and students’ performance in EFL class setting*

Emotion	Grade	N	Mean rank	Kruskal wallis test results
Enjoyment	F	15	166.97	$\chi^2(5) = 19.39,$ $p = .002$
	C	41	152.56	
	B	63	120.41	
	B+	74	135.74	
	A	32	169.75	
	A+	75	177.71	
Hope	F	15	102.73	$\chi^2(5) = 19.05,$ $p = .002$
	C	41	174.00	
	B	63	125.33	
	B+	74	142.01	
	A	32	159.44	
	A+	75	172.91	
Pride	F	15	127.50	$\chi^2(5) = 18.29,$ $p = .003$
	C	41	148.01	
	B	63	115.26	
	B+	74	158.19	
	A	32	159.84	
	A+	75	174.49	
Anger	F	15	208.73	$\chi^2(5) = 25.15,$ $p < .001$
	C	41	145.99	
	B	63	179.86	
	B+	74	155.24	
	A	32	130.42	
	A+	75	120.55	
Anxiety	F	15	182.60	$\chi^2(5) = 8.04,$ $p = .154$
	C	41	151.41	
	B	63	167.13	
	B+	74	151.61	
	A	32	141.05	
	A+	75	132.54	

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Emotion	Grade	N	Mean rank	Kruskal wallis test results
Shame	F	15	163.30	$\chi^2(5) = 6.88,$ $p = .230$
	C	41	153.01	
	B	63	165.29	
	B+	74	154.78	
	A	32	151.78	
	A+	75	129.37	
Hopelessness	F	15	167.87	$\chi^2(5) = 23.60,$ $p < .001$
	C	41	161.00	
	B	63	178.33	
	B+	74	163.08	
	A	32	121.61	
	A+	75	117.83	
Boredom	F	15	159.83	$\chi^2(5) = 10.82,$ $p = .055$
	C	41	152.45	
	B	63	160.87	
	B+	74	160.84	
	A	32	164.63	
	A+	75	122.63	

dissatisfaction linked to academic challenges or unmet expectations. Similarly, *hopelessness* varied significantly across grade levels, $\chi^2(5) = 23.60, p < .001$. B students reported the highest levels of hopelessness (Mean Rank = 178.33), followed by F students (Mean Rank = 167.87). On the other hand, *anxiety* and *shame* did not show significant differences across grade levels ($p = .154$ and $p = .230$, respectively). While these emotions may still play a role in students' experiences, they do not appear to vary meaningfully by grade in this context. *Boredom*, meanwhile, approached but did not reach statistical significance, $\chi^2(5) = 10.82, p = .055$.

Testing Setting

A series of Kruskal-Wallis tests also revealed significant differences in several emotions across grade levels during tests (see Table 3). For *enjoyment*, a statistically significant variation was found, $\chi^2(5) = 13.08, p = .023$. Students with A+ grades reported high levels of enjoyment (Mean Rank = 169.22), closely followed by those with C grades (Mean Rank = 170.55). In contrast, F students reported the lowest levels of enjoyment (Mean Rank = 104.47). *Hope* also demonstrated significant differences across grade levels, $\chi^2(5) = 17.45, p = .004$, with A+ students reporting the highest levels of *hope* (Mean Rank = 184.55). Similarly, *pride* showed significant variation, $\chi^2(5) = 19.12, p = .002$, with A-grade students (Mean Rank = 186.97) and A+ students (Mean Rank = 165.57) reporting the highest levels of pride during testing.

Table 3 *The Association between achievement emotions and students’ performance in EFL test setting*

Emotion	Grade	N	Mean rank	Kruskal wallis test results
Boredom	F	15	173.37	$\chi^2(5) = 10.44,$ $p = .064$
	C	41	148.18	
	B	63	170.88	
	B+	74	155.76	
	A	32	144.78	
	A+	75	127.33	
Enjoyment	F	15	104.47	$\chi^2(5) = 13.08,$ $p = .023$
	C	41	170.55	
	B	63	131.98	
	B+	74	146.31	
	A	32	148.67	
	A+	75	169.22	
Hope	F	15	148.60	$\chi^2(5) = 17.45,$ $p = .004$
	C	41	138.73	
	B	63	127.37	
	B+	74	146.57	
	A	32	141.28	
	A+	75	184.55	
Pride	F	15	144.10	$\chi^2(5) = 19.12,$ $p = .002$
	C	41	144.33	
	B	63	114.89	
	B+	74	154.49	
	A	32	186.97	
	A+	75	165.57	
Anger	F	15	188.57	$\chi^2(5) = 9.13,$ $p = .104$
	C	41	139.56	
	B	63	157.79	
	B+	74	161.83	
	A	32	151.89	
	A+	75	130.97	

(Continued)

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Emotion	Grade	N	Mean rank	Kruskal wallis test results
Anxiety	F	15	133.40	$\chi^2(5) = 10.56,$ $p = .061$
	C	41	149.30	
	B	63	159.19	
	B+	74	158.95	
	A	32	177.83	
	A+	75	127.28	
Shame	F	15	169.20	$\chi^2(5) = 5.73,$ $p = .333$
	C	41	152.90	
	B	63	150.77	
	B+	74	157.19	
	A	32	166.30	
	A+	75	131.88	
Hopelessness	F	15	152.77	$\chi^2(5) = 9.25,$ $p = .099$
	C	41	142.93	
	B	63	166.23	
	B+	74	166.16	
	A	32	131.91	
	A+	75	133.45	
Relief	F	15	146.37	$\chi^2(5) = 26.05,$ $p < .001$
	C	41	133.68	
	B	63	142.81	
	B+	74	136.32	
	A	32	221.97	
	A+	75	150.48	

Among the emotions analysed, *relief* showed the most pronounced statistical difference, $\chi^2(5) = 26.05, p < .001$, with A-grade students reporting the highest levels of relief (Mean Rank = 221.97), significantly higher than those in lower grade categories. This finding suggests that relief may be strongly tied to perceived success or fulfillment of expectations during tests. In contrast, negative emotions such as *boredom* ($p = .064$), *anger* ($p = .104$), *anxiety* ($p = .061$), *shame* ($p = .333$), and *hopelessness* ($p = .099$) did not show statistically significant differences across grade levels. These results indicate that such emotions may be experienced more uniformly among students regardless of their performance levels.

Self-directed Learning Setting

The analysis of achievement emotions in the learning setting revealed significant associations with academic performance for several emotions (see Table 4). *Hope* was significantly associated

with academic performance, $\chi^2(5) = 11.64, p = .040$. Students with higher grades, particularly those achieving an A+ (Mean Rank = 173.27), reported higher levels of hope compared to those with lower grades, such as F students (Mean Rank = 117.57). Similarly, *pride* was significantly related to academic performance, $\chi^2(5) = 15.49, p = .008$. Students with higher grades displayed greater pride, with A+ students (Mean Rank = 161.17) and A-grade students (Mean Rank = 174.17) reporting higher pride compared to their lower-achieving peers. *Enjoyment* also demonstrated a strong association with academic performance, $\chi^2(5) = 25.00, p < .001$. Students achieving an A+ reported the highest levels of enjoyment (Mean Rank = 177.43), significantly greater than those receiving an F (Mean Rank = 107.00).

Table 4 *The association between achievement emotions and students’ performance in EFL learning setting*

Emotion	Grade	N	Mean rank	Kruskal wallis test results
Hope	F	15	117.57	$\chi^2(5) = 11.64,$ $p = .040$
	C	41	160.30	
	B	63	130.01	
	B+	74	148.55	
	A	32	144.86	
	A+	75	173.27	
Pride	F	15	103.10	$\chi^2(5) = 15.49,$ $p = .008$
	C	41	176.10	
	B	63	132.21	
	B+	74	140.45	
	A	32	174.17	
	A+	75	161.17	
Anger	F	15	201.87	$\chi^2(5) = 19.64,$ $p = .001$
	C	41	144.30	
	B	63	168.18	
	B+	74	158.37	
	A	32	157.66	
	A+	75	117.94	
Anxiety	F	15	182.00	$\chi^2(5) = 7.45,$ $p = .190$
	C	41	137.83	
	B	63	162.21	
	B+	74	153.91	
	A	32	160.55	
	A+	75	133.64	

(Continued)

(Continuation)

Emotion	Grade	N	Mean rank	Kruskal wallis test results
Hopelessness	F	15	158.80	$\chi^2(5) = 17.45,$ $p = .004$
	C	41	126.38	
	B	63	175.54	
	B+	74	167.89	
	A	32	143.50	
	A+	75	126.83	
Boredom	F	15	173.43	$\chi^2(5) = 10.60,$ $p = .060$
	C	41	152.32	
	B	63	171.54	
	B+	74	154.06	
	A	32	141.41	
	A+	75	127.61	
Shame	F	15	199.00	$\chi^2(5) = 22.48,$ $p < .001$
	C	41	142.46	
	B	63	169.18	
	B+	74	166.98	
	A	32	142.39	
	A+	75	116.70	
Enjoyment	F	15	107.00	$\chi^2(5) = 25.00,$ $p < .001$
	C	41	140.83	
	B	63	115.96	
	B+	74	155.33	
	A	32	177.00	
	A+	75	177.43	

Among the negative emotions, *anger* was significantly associated with academic performance, $\chi^2(5) = 19.64, p = .001$. Students with an F grade had the highest levels of anger (Mean Rank = 201.87), while those achieving an A+ grade reported the lowest levels of anger (Mean Rank = 117.94). Similarly, *hopelessness* showed a significant association, $\chi^2(5) = 17.45, p = .004$. Higher-achieving students, such as those with A (Mean Rank = 143.50) and A+ grades (Mean Rank = 126.83), reported lower levels of hopelessness compared to F students (Mean Rank = 158.80). *Shame* also varied significantly across grade levels, $\chi^2(5) = 22.48, p < .001$. Students receiving an F grade experienced the highest levels of shame (Mean Rank = 199.00), while those achieving an A+ grade had the lowest levels (Mean Rank = 116.70).

Conversely, some negative emotions, such as *boredom*, approached but did not reach statistical significance, $\chi^2(5) = 10.60, p = .060$. Similarly, *anxiety* did not show a significant association with academic performance, $\chi^2(5) = 7.45, p = .190$, suggesting that these emotions may be more uniformly distributed across grade levels in this context.

Learning Styles and Achievement Emotions (RQ2)

The ANOVA analysis indicates that preferred learning styles significantly influence a range of achievement emotions, with statistical differences identified in seven out of nine emotions assessed (see Appendix A). Among the positive emotions, *enjoyment* displayed a significant effect ($F(3, 296) = 4.94, p = .002$), as did *hope* ($F(3, 296) = 4.43, p = .005$) and *pride* ($F(3, 296) = 5.85, p = .001$). For negative emotions, significant variation was observed for *anger* ($F(3, 296) = 3.48, p = .016$), *shame* ($F(3, 296) = 3.37, p = .019$), *hopelessness* ($F(3, 296) = 3.31, p = .021$), and *boredom* ($F(3, 296) = 5.92, p = .001$). These results suggest that levels of these positive and negative emotions vary notably depending on students' learning style preferences, potentially reflecting how well their preferred learning modes align with instructional methods.

Conversely, *anxiety* ($p = .053$) and *relief* ($p = .565$) did not reach statistical significance, suggesting that these emotions may be influenced more by external factors, rather than by alignment with learning styles.

To better understand the differences identified in the ANOVA analysis, a Tukey HSD Post Hoc analysis was performed to pinpoint the specific learning style groups responsible for the observed statistical differences in achievement emotions (see Appendix B).

For positive emotions, significant differences emerged between *read/write* learners and other groups. *Read/write* learners reported higher levels of enjoyment compared to *auditory* learners (Mean Difference [MD] = 0.38, $p = .005$) and *visual* learners ($MD = 0.27, p = .016$). Similarly, *hope* was higher for *read/write* learners compared to *auditory* learners ($MD = 0.39, p = .008$). *Pride* also displayed significant differences, with *read/write* learners reporting higher levels than *auditory* learners ($MD = 0.47, p = .001$). These results suggest that instructional strategies aligned with text-heavy methods may be particularly engaging and motivating for *read/write* learners.

For negative emotions, *read/write* learners consistently reported lower levels compared to other groups, particularly *visual* learners. For instance, *read/write* learners experienced less anger than *visual* learners ($MD = -0.28, p = .013$) and less shame ($MD = -0.29, p = .019$). Similarly, *hopelessness* was lower for *read/write* learners compared to *auditory* learners ($MD = -0.39, p = .012$). These findings suggest that aligning instructional methods with *read/write* learners' preferences may reduce feelings of frustration and self-doubt, fostering a more positive learning experience. Additionally, *read/write* learners experienced significantly less boredom than *auditory* learners ($MD = -0.34, p = .022$) and *visual* learners ($MD = -0.37, p < .001$). This indicates that text-based methods may be better suited to sustaining engagement for *read/write* learners, while *visual* and *auditory* learners may require additional instructional adaptations to avoid boredom and disengagement.

Overall, the results highlight the emotional impact of aligning instructional methods with students' preferred learning styles. *Read/write* learners tend to exhibit higher levels of positive emotions, such as *enjoyment*, *hope*, and *pride*, and lower levels of negative emotions, such as *anger*, *shame*, and *boredom*. In contrast, *visual* and *auditory* learners may require additional support or alternative teaching strategies to enhance their emotional engagement and mitigate negative emotions. These findings suggest that a more tailored approach to instruction could improve emotional engagement, ultimately benefiting learning outcomes.

Discussion

The findings from this study provide strong evidence of the intricate and multifaceted role of achievement emotions in EFL learning, revealing the interplay between students' emotional experiences and academic achievement as well as between their achievement emotions and preferred learning style. *Anger* and *hopelessness* in the classroom context were found to

be significantly negatively associated with learners' academic performance. This finding aligns with Pekrun et al. (2009), who confirmed that anger and hopelessness, along with other emotions such as boredom, anxiety, and shame, are significant negative predictors of academic performance. On the other hand, *enjoyment* in the self-directed learning setting demonstrated a positive correlation with academic performance, with students achieving B+ grades or above generally reporting the highest levels of enjoyment in this setting compared to the other settings while students with lower grades generally reporting the lowest levels, suggesting that students who experience joy in the learning process tend to achieve higher grades. This finding is supported by empirical evidence, which has consistently identified a positive relationship between enjoyment and performance (Dewaele et al., 2017; Pekrun et al., 2002). According to Pekrun's (2006) CVT, activating enjoyment enhances overall performance by sustaining attention, increasing interest and motivation, and promoting the use of flexible cognitive strategies.

Interestingly, the absence of significant relationships between test-related negative emotions and academic performance suggests that factors such as content knowledge and test preparation may play a more substantial role in influencing test outcomes. This finding aligns with previous research indicating that while emotions can affect performance, their impact is often moderated by contextual factors, such as the specific demands of a test setting (Pekrun et al., 2011; Pekrun et al., 2023), and individual factors, such as prior preparation and self-efficacy (Pekrun et al., 2017).

Analysing differences in achievement emotions between students achieving the highest grades and those achieving the lowest grades revealed complex patterns that challenge the linear view of emotions and academic success. In the classroom setting, a U-shaped distribution of enjoyment was observed, with both A+ and F students reporting the highest levels of enjoyment. This aligns with Piniel and Albert's (2018) findings on the non-linear nature of emotional experiences in language learning, suggesting that both high achievers and those facing significant challenges can experience heightened enjoyment, albeit likely for different reasons. High achievers may feel enjoyment from mastery, while low achievers may experience it from occasional successes or relief in less demanding moments.

In contrast, the testing context presented a different pattern: students with C grades reported the highest levels of *enjoyment* followed closely by A+ students. Furthermore, compared to other settings, C students mostly enjoyed the testing setting. This suggests that C students might find tests optimally challenging, providing a balance of skill and difficulty that can enhance enjoyment. This observation aligns with Pekrun's (2006) CVT, which posits that enjoyment arises when students perceive they have sufficient control over a task while also finding it valuable. C students may experience this balanced state more readily during tests, while those achieving higher grades, who may see the test as less challenging, derive enjoyment more from their proficiency than the task's difficulty.

A+ students expressed the highest levels of *hope* in the testing setting compared to other settings and to other grade levels, indicating a favourable expectation of their test performance, which may reflect their confidence and motivation. *Hope* also emerged as a key factor in academic performance within the learning context, with A+ students displaying higher mean levels of *hope* compared to their lower-achieving peers. Conversely, compared to all other achievement levels, F students reported the highest levels of *anger* and *shame* in nearly all contexts highlighting the significant emotional challenges they face, potentially stemming from repeated struggles and perceived academic inadequacies.

These findings reveal a clear emotional divide between students achieving B+ grades and above and those achieving below a B+, with the former group experiencing elevated levels

of positive emotions, such as *enjoyment* and *pride*, while the latter group encountered more negative emotions, including *anger* and *hopelessness*. This aligns with Goetz et al. (2006), who found that negative emotions are more prevalent among students experiencing academic difficulties. Such patterns suggest that positive emotions not only support academic engagement and success but may also serve as protective factors, enhancing resilience and persistence, whereas negative emotions can reinforce cycles of disengagement and underperformance in lower-achieving students.

The present study's findings also reveal that the rating of individual achievement emotions by each grade level tends to vary across the different academic settings. According to Pekrun et al. (2011), this can be attributed to the differences in social structures and functions between these settings. A key implication of this finding is the need for context-sensitive teaching strategies. For example, the testing context is particularly associated with high levels of anxiety and pressure. To address this, educators should implement strategies that promote emotional regulation, such as formative assessments (Bayat et al., 2017; Ismail et al., 2022) and low-stakes quizzes (Yang et al., 2023). These approaches help students develop confidence and reduce performance anxiety, ultimately improving learning outcomes (Ismail et al., 2022; Yang et al., 2023).

Moreover, in this study, *read/write* learners report more pronounced *enjoyment* and *pride*, which may be attributed to the alignment of traditional, text-based methods with their learning preferences. Furthermore, the mismatch between teaching styles and *visual* learners' preferred learning styles could account for the increased levels of negative emotions, such as *anger* and *shame*, among *visual* learners compared to *read/write* learners. This is concerning considering that D'Mello and Graesser's (2012) research found that these negative emotions can hinder cognitive processes. Visual materials might mitigate negative emotions in these learners by preventing cognitive overload and enhancing comprehension, thus supporting a smoother learning experience and promoting a more constructive emotional climate (D'Mello & Graesser, 2012).

Additionally, Tze et al. (2014) provide relevant insights into the role of boredom in educational settings, noting that boredom often arises when instructional material fails to stimulate students' interest or engagement. The study reveals that misalignment, particularly for *auditory* and *visual* learners, can lead to boredom, reinforcing Dörnyei's (2005) recommendation to diversify teaching methods to better engage students. Interestingly, *anxiety* and *relief* did not significantly vary across learning styles, which suggests that these emotions may be less dependent on learning style alignment and more influenced by external factors, such as task difficulty and evaluation pressure. Zeidner (2014) discusses that test-related anxiety is frequently triggered by performance pressure rather than instructional style, highlighting the importance of broader support systems, like exam preparation sessions, to address these specific stressors.

Finally, tailoring educational approaches to accommodate various learning styles such as the inclusion of visual elements for visual learners and audio revision for auditory learners (Fleming, 2001) is likely to foster positive achievement emotions. This supports Tze et al.'s (2014) recommendation for instructional adaptations that promote autonomy and engagement by catering to diverse student needs, ultimately creating a more supportive and effective learning environment. These adaptations could lead to a more emotionally balanced experience, facilitating both academic success and personal growth among students.

Conclusion

This study provides compelling insights into the complex role of achievement emotions in EFL learning, revealing how specific emotions influence academic outcomes across varied

contexts. Emotions such as *anger* and *hopelessness* in a classroom context as well as *shame* in self-directed learning, were significantly negatively associated with academic performance. These findings suggest that such emotions, when excessive, can undermine students' focus and motivation, ultimately impacting their academic success. In contrast, positive emotions, including *enjoyment* in self-directed learning and *hope* in testing contexts, demonstrated a beneficial influence, reflecting the impact of positive emotions in these settings to sustain engagement and enhance academic outcomes. The study also identified an emotional divide between students achieving high grades and those achieving the lowest grades, emphasising the importance of fostering positive emotional environments that support resilience and motivation. Furthermore, the variation in experiences of achievement emotions across the different academic settings highlights the need for context-sensitive teaching strategies.

Additionally, the findings indicate that emotionally informed teaching strategies that align with students' learning styles can enhance engagement and reduce negative emotions. For example, *read/write* learners benefited from text-based approaches, which fostered higher levels of *enjoyment* and *pride* and reduced levels of *anger*, *boredom*, *shame*, and *hopelessness*.

Overall, this study reinforces the value of integrating emotional considerations into EFL instruction, advocating for diverse and adaptive teaching approaches that address the affective needs of learners. By prioritising the emotional dimensions of academic engagement, educators and curriculum designers can cultivate environments that support both cognitive and emotional development, ultimately promoting improved academic outcomes and a more fulfilling learning experience.

Acknowledgement

The author extends her appreciation to the Deanship of Scientific Research at King Khalid University for funding this work through Small Group Research Project under grant number (RGP1/137/46).

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Appendix A

Achievement Emotions by Different Learning Styles

Table A1 Mean rating of achievement emotions by different learning styles

Emotion	Visual	Read/write	Auditory	kinaesthetic/ tactile
Enjoyment	3.13200	3.40404	3.02006	3.07449
Hope	3.24600	3.45875	3.06481	3.04924
Pride	3.25200	3.47306	3.00463	3.08712
Anger	2.91667	2.63215	2.76852	2.93939
Anxiety	2.94267	2.72896	2.96759	2.94318
Shame	2.89400	2.60438	2.87191	2.92045
Hopelessness	2.72000	2.54125	2.93364	2.76136
Boredom	2.99400	2.62009	2.95730	2.83081
Relief	3.27800	3.19949	3.11111	3.06818

Table A2 ANOVA analysis examining the relationship between preferred learning styles and reported achievement emotions

		Sum of Squares	df	Mean Square	F	Sig.
Enjoyment	Between Groups	6.793	3	2.264	4.936	.002
	Within Groups	135.765	296	.459		
	Total	142.558	299			
Hope	Between Groups	6.945	3	2.315	4.432	.005
	Within Groups	154.591	296	.522		
	Total	161.536	299			
Pride	Between Groups	8.660	3	2.887	5.853	.001
	Within Groups	145.989	296	.493		
	Total	154.649	299			
Anger	Between Groups	4.970	3	1.657	3.476	.016
	Within Groups	141.081	296	.477		
	Total	146.051	299			
Anxiety	Between Groups	3.248	3	1.083	2.590	.053
	Within Groups	123.730	296	.418		
	Total	126.978	299			

(Continued)

(Continuation)

		Sum of Squares	df	Mean Square	F	Sig.
Shame	Between Groups	5.488	3	1.829	3.371	.019
	Within Groups	160.638	296	.543		
	Total	166.125	299			
Hopelessness	Between Groups	5.574	3	1.858	3.307	.021
	Within Groups	166.298	296	.562		
	Total	171.872	299			
Boredom	Between Groups	8.454	3	2.818	5.918	.001
	Within Groups	140.931	296	.476		
	Total	149.384	299			
Relief	Between Groups	1.556	3	.519	.679	.565
	Within Groups	226.006	296	.764		
	Total	227.562	299			

Appendix B

Post Hoc Analysis using Tukey HSD Multiple Comparisons to Determine the Actual Learning Styles that Showed the Statistically Significant Difference

Emotion	(I) Learning Style	(J) Learning Style	Mean		Sig.	95% Confidence Interval	
			Difference (I–J)	Std. Error		Lower Bound	Upper Bound
Enjoyment	Auditory	Kinaesthetic/tactile	–.05443	.17130	.989	–.4970	.3881
		Read/write	–.38398*	.11457	.005	–.6800	–.0880
		Visual	–.11194	.11029	.741	–.3969	.1730
		Auditory	.05443	.17130	.989	–.3881	.4970
	Kinaesthetic/tactile	Read/write	–.32955	.15963	.167	–.7420	.0829
		Visual	–.05751	.15658	.983	–.4621	.3471
		Auditory	.38398*	.11457	.005	.0880	.6800
	Read/write	Kinaesthetic/tactile	.32955	.15963	.167	–.0829	.7420
		Visual	.27204*	.09112	.016	.0366	.5075
		Auditory	.11194	.11029	.741	–.1730	.3969
	Visual	Kinaesthetic/tactile	.05751	.15658	.983	–.3471	.4621
		Read/write	–.27204*	.09112	.016	–.5075	–.0366
Hope	Auditory	Kinaesthetic/tactile	.01557	.18279	1.000	–.4567	.4878
		Read/write	–.39394*	.12226	.008	–.7098	–.0781
		Visual	–.18119	.11768	.415	–.4852	.1229
		Auditory	–.01557	.18279	1.000	–.4878	.4567
	Kinaesthetic/tactile	Read/write	–.40951	.17034	.078	–.8496	.0306
		Visual	–.19676	.16709	.641	–.6285	.2349
		Auditory	.39394*	.12226	.008	.0781	.7098
	Read/write	Kinaesthetic/tactile	.40951	.17034	.078	–.0306	.8496
		Visual	.21275	.09723	.129	–.0385	.4640
		Auditory	.18119	.11768	.415	–.1229	.4852
	Visual	Kinaesthetic/tactile	.19676	.16709	.641	–.2349	.6285
		Read/write	–.21275	.09723	.129	–.4640	.0385

(Continued)

(Continuation)

Emotion	(I) Learning Style	(J) Learning Style	Mean		Sig.	95% Confidence Interval	
			Difference (I–J)	Std. Error		Lower Bound	Upper Bound
Pride	Auditory	Kinaesthetic/tactile	–.08249	.17763	.967	–.5414	.3764
		Read/write	–.46843*	.11881	.001	–.7754	–.1615
		Visual	–.24737	.11436	.136	–.5429	.0481
		Auditory	.08249	.17763	.967	–.3764	.5414
	Kinaesthetic/tactile	Read/write	–.38594	.16553	.093	–.8136	.0417
		Visual	–.16488	.16237	.741	–.5844	.2546
		Auditory	.46843*	.11881	.001	.1615	.7754
	Read/write	Kinaesthetic/tactile	.38594	.16553	.093	–.0417	.8136
		Visual	.22106	.09449	.092	–.0231	.4652
		Auditory	.24737	.11436	.136	–.0481	.5429
	Visual	Kinaesthetic/tactile	.16488	.16237	.741	–.2546	.5844
		Read/write	–.22106	.09449	.092	–.4652	.0231
Anger	Auditory	Kinaesthetic/tactile	–.17088	.17462	.762	–.6220	.2803
		Read/write	.13636	.11679	.648	–.1654	.4381
		Visual	–.14815	.11243	.552	–.4386	.1423
		Auditory	.17088	.17462	.762	–.2803	.6220
	Kinaesthetic / tactile	Read/write	.30724	.16272	.235	–.1132	.7277
		Visual	.02273	.15962	.999	–.3897	.4351
		Auditory	–.13636	.11679	.648	–.4381	.1654
	Read/write	Kinaesthetic/tactile	–.30724	.16272	.235	–.7277	.1132
		Visual	–.28451*	.09288	.013	–.5245	–.0445
		Auditory	.14815	.11243	.552	–.1423	.4386
	Visual	Kinaesthetic/tactile	–.02273	.15962	.999	–.4351	.3897
		Read/write	.28451*	.09288	.013	.0445	.5245

(Continued)

(Continuation)

Emotion	(I) Learning Style	(J) Learning Style	Mean		Sig.	95% Confidence Interval	
			Difference (I–J)	Std. Error		Lower Bound	Upper Bound
Anxiety	Auditory	Kinaesthetic/tactile	.02441	.16353	.999	–.3981	.4469
		Read/write	.23864	.10938	.131	–.0440	.5212
		Visual	.02493	.10528	.995	–.2471	.2969
		Auditory	–.02441	.16353	.999	–.4469	.3981
	Kinaesthetic / tactile	Read/write	.21423	.15239	.497	–.1795	.6080
		Visual	.00052	.14948	1.000	–.3857	.3867
		Auditory	–.23864	.10938	.131	–.5212	.0440
	Read/write	Kinaesthetic/tactile	–.21423	.15239	.497	–.6080	.1795
		Visual	–.21371	.08698	.069	–.4385	.0110
		Auditory	–.02493	.10528	.995	–.2969	.2471
	Visual	Kinaesthetic/tactile	–.00052	.14948	1.000	–.3867	.3857
		Read/write	.21371	.08698	.069	–.0110	.4385
Shame	Auditory	Kinaesthetic/tactile	–.04854	.18633	.994	–.5300	.4329
		Read/write	.26754	.12463	.141	–.0545	.5895
		Visual	–.02209	.11996	.998	–.3320	.2879
		Auditory	.04854	.18633	.994	–.4329	.5300
	Kinaesthetic / tactile	Read/write	.31608	.17364	.266	–.1325	.7647
		Visual	.02645	.17032	.999	–.4136	.4665
		Auditory	–.26754	.12463	.141	–.5895	.0545
	Read/write	Kinaesthetic/tactile	–.31608	.17364	.266	–.7647	.1325
		Visual	–.28962*	.09911	.019	–.5457	–.0335
		Auditory	.02209	.11996	.998	–.2879	.3320
	Visual	Kinaesthetic/tactile	–.02645	.17032	.999	–.4665	.4136
		Read/write	.28962*	.09911	.019	.0335	.5457

(Continued)

(Continuation)

Emotion	(I) Learning Style	(J) Learning Style	Mean		Sig.	95% Confidence Interval	
			Difference (I–J)	Std. Error		Lower Bound	Upper Bound
Hopelessness	Auditory	Kinaesthetic/tactile	.17228	.18958	.800	–.3175	.6621
		Read/write	.39240*	.12680	.012	.0648	.7200
		Visual	.21364	.12206	.300	–.1017	.5290
		Auditory	–.17228	.18958	.800	–.6621	.3175
	Kinaesthetic / tactile	Read/write	.22012	.17667	.598	–.2363	.6766
		Visual	.04136	.17330	.995	–.4064	.4891
		Auditory	–.39240*	.12680	.012	–.7200	–.0648
	Read/write	Kinaesthetic/tactile	–.22012	.17667	.598	–.6766	.2363
		Visual	–.17875	.10084	.289	–.4393	.0818
		Auditory	–.21364	.12206	.300	–.5290	.1017
	Visual	Kinaesthetic / tactile	–.04136	.17330	.995	–.4891	.4064
		Read/write	.17875	.10084	.289	–.0818	.4393
Boredom	Auditory	Kinaesthetic/tactile	.12650	.17452	.887	–.3244	.5774
		Read/write	.33721*	.11673	.022	.0356	.6388
		Visual	–.03670	.11237	.988	–.3270	.2536
		Auditory	–.12650	.17452	.887	–.5774	.3244
	Kinaesthetic/tactile	Read/write	.21072	.16264	.566	–.2095	.6309
		Visual	–.16319	.15953	.736	–.5754	.2490
		Auditory	–.33721*	.11673	.022	–.6388	–.0356
	Read/write	Kinaesthetic / tactile	–.21072	.16264	.566	–.6309	.2095
		Visual	–.37391*	.09283	.000	–.6138	–.1341
		Auditory	.03670	.11237	.988	–.2536	.3270
	Visual	Kinaesthetic/tactile	.16319	.15953	.736	–.2490	.5754
		Read/write	.37391*	.09283	.000	.1341	.6138

(Continued)

(Continuation)

Emotion	(I) Learning Style	(J) Learning Style	Mean		Sig.	95% Confidence Interval	
			Difference (I–J)	Std. Error		Lower Bound	Upper Bound
Relief	Auditory	Kinaesthetic/tactile	.04293	.22101	.997	–.5281	.6139
		Read/write	–.08838	.14782	.933	–.4703	.2935
		Visual	–.16689	.14229	.644	–.5345	.2008
		Auditory	–.04293	.22101	.997	–.6139	.5281
	Kinaesthetic/tactile	Read/write	–.13131	.20596	.920	–.6634	.4008
		Visual	–.20982	.20203	.727	–.7318	.3122
		Auditory	.08838	.14782	.933	–.2935	.4703
	Read/write	Kinaesthetic/tactile	.13131	.20596	.920	–.4008	.6634
		Visual	–.07851	.11756	.909	–.3822	.2252
		Auditory	.16689	.14229	.644	–.2008	.5345
	Visual	Kinaesthetic/tactile	.20982	.20203	.727	–.3122	.7318
		Read/write	.07851	.11756	.909	–.2252	.3822

*. The mean difference is significant at the 0.05 level.