

Beyond Anxiety Reduction: Multidimensional Foreign Language Classroom Anxiety in Humor-Integrated PBL

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Abstract

Foreign language classroom anxiety remains a major challenge in English as a Foreign Language (EFL) speaking classrooms. Although humor and Project-Based Learning (PBL) have been associated with positive emotional outcomes, little is known about how different dimensions of anxiety change when these approaches are integrated. This study investigated changes in foreign language classroom anxiety and its dimensions—Communication Apprehension (CA), Test Anxiety (TA), and Fear of Negative Evaluation (FNE)—following the implementation of Humor-Integrated Project-Based Learning (HPBL). A sequential explanatory mixed-methods design was employed involving 60 undergraduate EFL students at a private university in Indonesia. Quantitative data were collected using the Foreign Language Classroom Anxiety Scale (FLCAS) and analyzed using descriptive and non-parametric inferential statistics, while qualitative interview data were analyzed thematically. The findings revealed no significant change in overall anxiety. However, Communication Apprehension decreased significantly ($p = .030$, $r = .40$), as did Test Anxiety ($p = .004$, $r = .52$), whereas Fear of Negative Evaluation showed a significant posttest difference between groups ($p < .001$, $r = .48$). Qualitative findings suggested that students perceived HPBL as promoting a more relaxed and collaborative learning environment while heightening audience awareness and sensitivity to peer evaluation. These findings extend Complex Dynamic Systems Theory (CDST) by suggesting that anxiety develops multidimensionally rather than uniformly across instructional contexts and support Control-Value Theory (CVT) by illustrating the coexistence of positive and negative emotional experiences during humor-integrated collaborative speaking tasks. The findings offer practical implications for teachers by suggesting that humor-integrated speaking activities should balance emotional support with strategies for managing communicative and evaluative demands.

Keywords: foreign language classroom anxiety, Humor-Integrated Project-Based Learning, EFL speaking, Complex Dynamic Systems Theory, Control-Value Theory

1. Introduction

Foreign language classroom anxiety (FLCA) has long been recognized as one of the most influential affective factors in second and foreign language learning because it shapes learners' participation, engagement, and communication performance (Dewaele & MacIntyre, 2014; Horwitz et al., 1986; Yu, 2024). In EFL classrooms, anxiety is particularly visible during speaking activities where learners are required to produce language spontaneously in front of teachers and peers (Maher & King, 2022). Previous studies have shown that anxious learners often demonstrate lower willingness to communicate, reduced classroom participation, and weaker speaking performance (Liu, 2022; MacIntyre & Gardner, 1991; Teimouri et al., 2019; Zhang, 2019). Because oral communication involves immediate linguistic processing as well as social evaluation, speaking activities frequently become emotionally demanding experiences for many language learners (Höl & Kasiml, 2022). FLCA has commonly been conceptualized as a negative emotional state associated with tension, nervousness, and worry in language learning situations (Horwitz et al., 1986; Yu, 2024). However, contemporary perspectives increasingly emphasize that anxiety should not be understood as a singular or static construct. Instead, researchers have argued that foreign language classroom anxiety is multidimensional, encompassing Communication Apprehension (CA), Test Anxiety (TA), and Fear of Negative Evaluation (FNE) (Horwitz et al., 1986; Teimouri et al., 2019). CA refers to learners' nervousness during interaction and oral communication, TA relates to fear associated with academic evaluation and performance, while FNE concerns learners' worries about being judged by others. Since these dimensions emerge from different classroom experiences, they may also respond differently to instructional environments and pedagogical interventions. In recent years, perspectives on second language acquisition have increasingly shifted

from viewing learner characteristics as relatively stable individual differences toward understanding learners' psychological experiences as dynamic and shaped by interactions with diverse contexts (Dewaele & Dewaele, 2020; Dörnyei & Ryan, 2015). This perspective is closely aligned with Complex Dynamic Systems Theory (CDST), which conceptualizes learner emotions as continuously emerging from interactions among individual, social, and instructional factors rather than existing as stable psychological traits (Dewaele & Dewaele, 2020; MacIntyre, 2017; Wang et al., 2024). Recent studies further suggest that FLCA may fluctuate dynamically across speaking tasks and interactional situations rather than remaining stable throughout instruction (Aubrey, 2022; Dewaele & Pavelescu, 2019; Muftah & Alhazmi, 2024). Within this perspective, learners' emotional experiences may fluctuate across activities, interactions, and classroom situations. As a result, anxiety may not simply increase or decrease uniformly throughout instruction. Instead, different anxiety dimensions may develop in different ways depending on the nature of classroom tasks, interaction patterns, and learning environments (Bai, 2023; Dewaele & MacIntyre, 2024; Wang & Li, 2022). This suggests that examining only overall anxiety scores may obscure important emotional variations experienced by learners during classroom activities (Wang et al., 2024).

At the same time, contemporary language pedagogy has increasingly emphasized the importance of student-centered and emotionally supportive learning environments (Guo et al., 2020; Wijnia et al., 2024). One instructional approach that has received considerable attention is Project-Based Learning (PBL). PBL promotes collaborative, inquiry-oriented, and authentic learning experiences in which students actively engage in the completion of meaningful projects (Jaleniauskiene & Venckiene, 2025; Thomas, 2000). In language learning contexts, PBL has been associated with increased interaction, learner autonomy, collaboration, and communicative engagement (Jaleniauskiene & Venckiene, 2025; Stoller, 2002). Because PBL requires learners to negotiate meaning, exchange ideas, and present project outcomes, it is often considered beneficial for speaking development and communicative competence. Nevertheless, PBL may also generate emotionally demanding situations. Collaborative discussions, peer interaction, project presentations, and public performances may simultaneously expose learners to communication pressure and social evaluation (Huang et al., 2024). While some learners may feel more confident through collaborative support, others may experience heightened nervousness due to increased interactional demands (Huang et al., 2024). This indicates that PBL may influence different dimensions of anxiety in different ways rather than simply reducing anxiety as a whole (Huang et al., 2024).

To support emotionally positive learning experiences, humor has increasingly been incorporated into language teaching practices (Banas et al., 2011; Zhou et al., 2026). Humor is widely believed to contribute to a more relaxed, supportive, and enjoyable classroom atmosphere (Alsakaker, 2025; Banas et al., 2011; Zhou et al., 2026). In educational settings, humor may reduce tension, foster interpersonal closeness, encourage participation, and create more comfortable interactional environments (Mohammad Hosseini et al., 2022; Zhou et al., 2026). Within EFL classrooms, teacher and peer humor have been associated with greater enjoyment, engagement, and emotional comfort among learners (Purwanti et al., 2024; St-Amand et al., 2024). Humor may also help learners perceive speaking activities as less threatening, thereby lowering emotional barriers during communication (Purwanti et al., 2024). From the perspective of positive psychology and Control-Value Theory (CVT), such emotionally supportive experiences may foster positive achievement emotions when learners perceive classroom activities as both valuable and manageable (Dewaele & MacIntyre, 2014; Li, 2022; Wang, 2022). However, emotional experiences in language learning are often complex and non-linear. Although humor is commonly assumed to reduce anxiety, its effects may vary depending on learners' perceptions, classroom dynamics, and interactional contexts (Dewaele & Dewaele, 2020). CVT further suggests that positive and negative emotions may coexist when learners simultaneously experience enjoyment, performance demands, and concerns about social evaluation during achievement-related activities (Pekrun et al., 2017). For example, humor integrated into collaborative project activities may create a more enjoyable environment for some learners while simultaneously increasing performance pressure for others during public speaking or peer evaluation (Bozkurt & Aydin, 2023; Pekrun et al., 2017).

In the present study, humor-integrated PBL (HPBL) refers to a project-based speaking approach in which humor was intentionally embedded throughout multiple stages of the project process rather than used merely as occasional classroom entertainment. Humor became part of the collaborative speaking tasks, including humor analysis, topic exploration, script development, rehearsal, discussion, and stand-up comedy performance preparation. The final project product required students to collaboratively produce and perform stand-up comedy content in English. Students worked collaboratively to develop humorous speaking performances while continuously engaging in English discussion, negotiation, rehearsal, and peer interaction throughout the project activities. Different collaborative roles, such as research team, scriptwriter, and performer, were designed to maintain students' active communicative participation across the project process. Humor therefore functioned not only as classroom atmosphere support, but also as a central communicative and interactional component within the speaking project itself.

Despite growing interest in humor, PBL, and classroom emotions, limited research has specifically examined how HPBL shapes the multidimensional nature of foreign language classroom anxiety. Existing studies frequently focus on overall anxiety reduction without examining how individual anxiety components may change differently across instructional processes. As a result, the emotional complexity of learners' classroom experiences may remain insufficiently understood. In response to this gap, the present study investigates anxiety within a HPBL environment in EFL speaking classrooms. Rather than focusing solely on whether anxiety decreases, this study adopts a multidimensional perspective by addressing two research questions: (1) To what extent does HPBL influence FLCA and its dimensions (CA, TA, and FNE)? and (2) How do students' perceptions of humor in PBL explain changes in FLCA? Through these questions, the present study is expected to provide insights into how HPBL shapes foreign language classroom anxiety by offering a more nuanced understanding of learners' emotional experiences in EFL speaking classrooms.

Theoretically, the study is expected to extend current understanding of FLCA by examining its multidimensional nature within HPBL. In doing so, it offers empirical insights relevant to CDST and CVT, particularly regarding the dynamic development of anxiety across different dimensions rather than as a single affective construct. Pedagogically, the findings are expected to inform the design of HPBL that balance emotional support with communicative and evaluative demands, helping teachers foster participation while remaining attentive to learners' emotional challenges. More broadly, the study is expected to contribute to research on affective factors in EFL education by encouraging further investigation into how humor shapes learners' emotional experiences beyond overall anxiety reduction across diverse instructional contexts.

2. Method

2.1 Research Design and Participants

This study employed a sequential explanatory mixed-methods design (Creswell & Plano Clark, 2018) to investigate changes in students' FLCA following the implementation of HPBL in an EFL speaking classroom. The quantitative phase adopted a quasi-experimental pretest-posttest design involving an experimental and a control group. Both groups participated in Project-Based Learning activities; however, the experimental group implemented HPBL through a stand-up comedy project, whereas the control group implemented Project-Based Learning (PBL) through a podcast project. Quantitative data were collected to examine changes in overall foreign language classroom anxiety and its three dimensions: CA, TA, and FNE. The subsequent qualitative phase consisted of semi-structured interviews conducted to explain and elaborate the quantitative findings. The study was conducted at a private university in Jakarta, Indonesia, involving 60 first-semester undergraduate students enrolled in an English as a Foreign Language (EFL) speaking course within an Informatics Engineering program. Before data collection, permission to conduct the study was obtained from the Head of the Informatics Engineering Study Program. Six existing classes were initially considered for participation. The researcher explained the study objectives, procedures, voluntary nature of participation, and use of student data to the students. Two classes that agreed to participate and had relatively comparable pretest performance were selected for the study. Because these were pre-existing intact classes, students were not individually randomized. One class was designated as the experimental group and the other as the control group by the researcher and course instructor. Students with poor attendance, incomplete project participation, or missing post-test data were excluded from the final analysis (Memon et al., 2025).

2.2 Data Collection

2.2.1 Foreign Language Classroom Anxiety Scale (FLCAS)

Quantitative data were collected using the 33-item FLCAS developed by Horwitz et al. (1986), which measures three dimensions of FLCA: CA, TA, and FNE. The original instrument demonstrated high internal consistency (Cronbach's $\alpha = .93$) and test-retest reliability (.83) (Horwitz et al., 1986). In the present study, the FLCAS also showed high reliability (Cronbach's $\alpha = .902$). Responses were collected using a five-point Likert scale before and after the intervention.

2.2.2 Semi-Structured Interview

Following the quantitative phase, six participants from the experimental group were purposively selected using maximum variation sampling (Patton, 2015). Selection was based on changes in overall FLCA and its three dimensions—CA, TA, and FNE—to represent diverse anxiety trajectories (i.e., decreased, increased, stable, and mixed) across collaborative roles (researcher, scriptwriter, and performer) (Palinkas et al., 2015). Semi-structured interviews were conducted to explore students' perceptions of HPBL, collaborative speaking activities, and anxiety experiences. Prior to data collection, the interview protocol was reviewed by two experts in English language teaching and qualitative research and revised based on their feedback.

2.3 Procedure

The intervention was implemented over twelve meetings following four stages adapted from the PBL framework: (1) Initial Planning and Problem Identification, (2) Project Development, (3) Presentation and Evaluation, and (4) Reflection

and Continuous Learning. Throughout the project, students participated in humor-integrated speaking activities, including humor analysis, discussion, research, script development, rehearsal, and stand-up comedy performance. The overall procedure is summarized in Table 1.

Table 1. Procedure of the Intervention

Weeks	PBL Stage	Main Activities
1-2	Initial Planning and Problem Identification	Project orientation, humor introduction, group formation, pretest
3-7	Project Development	Humor analysis, research, scriptwriting, rehearsal, peer feedback
8-10	Presentation and Evaluation	Performance preparation, video production, YouTube submission
11-12	Reflection and Continuous Learning	Posttest, reflection, interviews

Following the project framework presented in Table 1, students were assigned to three primary collaborative roles: Research Team, Scriptwriter, and Performer. Although only performers delivered the final stand-up comedy performance, all roles actively participated in English-speaking activities throughout the project, including discussions, research presentations, script development, rehearsal, and peer feedback. Weekly collaborative discussions, together with the final stand-up comedy performance, were recorded and uploaded to YouTube as part of the project documentation, accompanied by progress reports describing each group's development. This design ensured that speaking practice was embedded throughout the intervention rather than being limited to the final performance. To promote implementation consistency, a project guideline outlining the objectives, procedures, and learning activities of HPBL was provided to both the instructor and students, and regular consultation between the researcher and the course instructor was conducted throughout the intervention. Although no formal fidelity instrument was employed, these procedures helped maintain consistent implementation across all project stages.

2.4 Data Analysis

Quantitative data were analyzed using descriptive statistics. Data normality was then assessed using the Shapiro–Wilk test to determine the appropriate inferential procedures. Within-group pretest–posttest differences were examined using the Wilcoxon Signed-Rank Test, while posttest differences between groups were examined using the Mann–Whitney U Test. Effect sizes were calculated using r to assess the magnitude of the observed differences. For the qualitative phase, interview transcripts were reviewed repeatedly and coded to identify meaningful segments related to students' perceptions of HPBL and anxiety experiences. Related codes were grouped into broader categories, which were subsequently reviewed and refined into themes. The resulting themes were then used to explain and elaborate the quantitative findings in accordance with the sequential explanatory mixed-methods design. Although the themes were generated inductively, their interpretation was informed by CDST and CVT.

3. Results

3.1 Changes in FLCA and Its Dimensions Following HPBL

Table 2. Descriptive Statistics of FLCA and Its Dimensions

Variable	HPBL				PBL			
	Pretest		Posttest		Pretest		Posttest	
	M	D	M	D	M	D	M	D
Overall Anxiety	3.14	.38	3.08	.34	3.04	.44	2.93	.44
CA	3.27	.42	3.14	.34	3.22	.48	3.05	.48
TA	3.00	.45	2.97	.40	2.84	.51	2.81	.45
FNE	3.06	.47	3.29	.46	3.18	.50	2.96	.57

Table 2 presents the descriptive statistics for overall FLCA and its three dimensions across the two instructional groups. Overall anxiety remained relatively stable in both groups. However, different patterns emerged across the anxiety dimensions. In the HPBL group, CA decreased slightly, TA remained relatively stable, whereas FNE increased. In contrast, the PBL group demonstrated slight decreases in CA and FNE, while TA remained stable. The Shapiro–Wilk test indicated that several posttest datasets violated the assumption of normality. Therefore, non-parametric analyses were employed throughout the inferential analyses, using the Wilcoxon Signed-Rank Test for within-group comparisons and the Mann–Whitney U Test for posttest comparisons between groups.

Table 3. Inferential Analysis of FLCA and Its Dimensions

Variable	PBL (Pre–Post)			HPBL (Pre–Post)			HPBL vs. PBL (Posttest)		
	Statistic	p	r	Statistic	p	r	Statistic	p	r
Overall Anxiety	$Z = -1.070$	.285	.20	$Z = -0.203$	.839	.04	$U = 427.00$	.732	.04
CA	$Z = -2.288$	.022	.42	$Z = -2.169$	.030	.40	$U = 427.50$	.737	.04
TA	$Z = -0.160$	.873	.03	$Z = -2.869$	.004	.52	$U = 385.50$	.337	.12
FNE	$Z = -1.466$	.143	.27	$Z = -2.283$	.022	.42	$U = 199.00$	<.001	.48

Table 3 presents the inferential analyses of overall FLCA and its dimensions. No significant within- or between-group differences were observed for overall anxiety. At the dimensional level, significant within-group changes in CA were found in both instructional groups despite modest descriptive decreases. TA decreased significantly only in the HPBL group, whereas FNE increased significantly in the HPBL group and was the only dimension demonstrating a significant posttest difference between groups. Taken together, these findings indicate that HPBL did not produce a uniform change in FLCA but instead influenced its dimensions in different ways. These contrasting quantitative findings were further explored through qualitative analyses to better understand students' experiences during HPBL.

3.2 Students' Perceptions Explaining Changes in FLCA and Its Dimensions

Thematic analysis identified five themes explaining these patterns: Relaxed Classroom Atmosphere, Collaborative Emotional Support, Increased Communicative Exposure, Audience Awareness and Social Evaluation, and Humor as a Double-Edged Emotional Experience (Table 4).

Table 4. Summary of Themes Explaining Changes in FLCA

Theme	Indicator
Relaxed Classroom Atmosphere (Explaining Reduced TA)	Emotional comfort and reduced classroom tension Enjoyable and less evaluative learning Reduced fear of mistakes
Collaborative Emotional Support (Explaining Stable Overall Anxiety)	Shared responsibility and peer support Confidence through collaborative rehearsal Spontaneous speaking participation
Communicative Exposure During Humor-Integrated PBL (Explaining Changes in CA)	Communicative pressure during humorous interaction Speaking demands across collaborative roles Communication difficulty under humor demands
Audience Awareness and Concern About Social Evaluation (Explaining Increased FNE)	Fear of unsuccessful humor performance Embarrassment and peer judgment Sensitivity toward audience reactions Cultural and interpersonal sensitivity
Humor as a Double-Edged Emotional Experience (Cross-Dimensional Explanation)	Emotional comfort and pressure simultaneously Reduced linguistic fear but increased pressure to entertain Increased emotional complexity of speaking Unequal emotional impact of humor

3.2.1 Relaxed Classroom Atmosphere

Participants perceived HPBL as less formal and less intimidating than conventional speaking tasks. P16 explained that “humor made the classroom atmosphere more relaxed because we were doing the speaking activities with friends in a more casual way, not like a test situation,” while P15 described speaking practice as feeling “more like playing than taking a test because we could enjoy the process without worrying too much about grades or mistakes.” Similarly, P27 noted that “we could laugh together at small mistakes, so it did not feel embarrassing when we made errors during speaking,” whereas P29 explained that “humor helped create a supportive environment where we could speak without feeling judged.” P16 also stated that shared laughter “reduced fear of making mistakes and made us more confident to try speaking again,” and P26 added that “the project felt more relaxed and less tense because the people I talked to were my own friends.” These perceptions help explain the significant reduction in TA observed in the quantitative findings by illustrating how humor, peer familiarity, and collaborative interaction reduced the evaluative nature of speaking activities. However, this experience was not universal. P13 explained that he still “felt tense during humor-based activities, especially when I had to speak spontaneously in front of others,” suggesting that the emotional benefits of humor varied according to students’ speaking confidence and communicative readiness.

3.2.2 Collaborative Emotional Support

Several participants explained that emotional pressure became easier to handle because responsibility was distributed across group members rather than carried individually. For example, P15 emphasized the importance of “teamwork, solidarity, and responsibility from the beginning until the end of the project, because every member had their own role but still depended on each other,” while P29 explained that group members “supported each other and did not laugh at each other’s mistakes, so I felt more confident when speaking.” Repeated discussion, rehearsal, and peer interaction strengthened students’ confidence in speaking English. P29 explained that “through discussion and group practice, I became more comfortable speaking English because I felt safe making mistakes,” while P16 stated that after “practicing together many times and getting support from friends, I gradually became more confident and less afraid of speaking in English.” Even participants who remained anxious acknowledged the value of teamwork. For example, P13 explained

that humor helped because there was “a lot of teamwork that made me feel less isolated even when I was still nervous.” Together, these findings suggest that collaborative interaction promoted emotional support and helped maintain relatively stable overall FLCA.

3.2.3 Communicative Exposure During HPBL

Students actively engaged in oral interaction, spontaneous discussion, rehearsal, and collaborative communication. P15 explained that “humor made me speak more often because we kept trying different ideas and rehearsing the jokes many times, so I had to speak repeatedly during the process,” while P29 stated that humor encouraged her to “immediately try to express things in English without overthinking too much during discussion.” Humor also increased interactional demands. P15 explained that “humor often involved improvisation, so we had to react quickly and adjust our speech depending on the situation during rehearsal,” while P16 noted that he had to “repeat sentences several times until they sounded funny, natural, and clear for the audience.” P19 added that speaking occurred while “explaining vocabulary to the performance team and discussing how to make the punchlines clearer and more understandable.”

However, increased communicative participation was also perceived as challenging. P15 admitted feeling pressure to “make our group video funny while still speaking English correctly,” while P13 explained that he was “not used to it yet, especially when I had to speak during discussions and express ideas quickly in English.” Together, these findings suggest that increased communicative exposure was accompanied by greater pressure to respond, improvise, and communicate effectively, helping explain the significant within-group changes observed in CA.

3.2.4 Audience Awareness and Concern About Social Evaluation

Participants expressed concern that their jokes might not be understood or considered funny by the audience. P15 reported being afraid that “my jokes would not be funny, even though I already practiced them several times with my group,” while P16 expressed concern that “my material would not be funny or the audience would not laugh during the performance.” Similarly, P29 noted that jokes might be difficult for the audience to understand even if they were effective during practice sessions, whereas P19 worried that the audience might “feel uncomfortable if the joke was not delivered properly,” and P27 described anxiety when “our jokes received no response at all, even after we prepared them carefully.” P27 also described the difficulty of “adjusting humor to the audience's culture and background so that the joke could be understood correctly,” highlighting the importance of audience interpretation and social appropriateness. Together, these findings explain the increase in FNE observed in the quantitative analysis by showing that students remained concerned about audience acceptance, peer judgment, and the social appropriateness of their humorous performances.

3.2.5 Humor as a Double-Edged Emotional Experience

The final theme reflected the double-edged emotional nature of HPBL. Although participants frequently associated humor with a more relaxed and enjoyable classroom experience, they also described emotional demands related to communicative exposure, audience expectations, and humorous performance. Participants reported feeling more comfortable making linguistic mistakes while simultaneously experiencing pressure to entertain the audience. For example, P16 and P13 both reported feeling “pressured because they had to be funny while also ensuring their English delivery was clear and understandable for the audience,” highlighting the additional emotional demands introduced by humor. Students also differed in how they experienced HPBL. While many participants perceived the activities as enjoyable and emotionally supportive, P13 reported continued tension and limited emotional comfort, explaining that he still “felt tense even during practice and rehearsal sessions.” This negative case indicates that the emotional benefits of humor were not experienced equally across learners.

Taken together, these findings explain why HPBL did not produce a uniform change in FLCA. Instead, humor simultaneously fostered emotional comfort while increasing communicative and evaluative demands. Consistent with CDST, these experiences suggest that anxiety fluctuated across different classroom situations rather than remaining stable throughout the learning process (Dewaele & Dewaele, 2020; MacIntyre, 2017). Likewise, CVT explains the coexistence of enjoyment and anxiety during humor-based speaking activities (Dewaele & MacIntyre, 2014).

4. Discussion

The present study investigated how foreign language classroom anxiety changed following the implementation of HPBL in EFL speaking activities. The findings revealed that overall FLCA did not change significantly in either the experimental or control group. Effect size analyses further indicated negligible practical effects for the HPBL intervention on overall anxiety levels. However, different patterns emerged across the anxiety dimensions. In the experimental group, TA showed evidence of a statistically significant decrease, although this pattern may have been influenced by multiple factors beyond the intervention itself. CA and FNE, meanwhile, showed significant changes, with CA showing a slight decrease and FNE showing a slight increase in posttest mean scores. By contrast, the control group generally showed more stable or decreasing anxiety patterns across dimensions. The qualitative findings further indicated that students perceived HPBL

as simultaneously supportive and demanding during collaborative speaking activities.

The relatively stable overall anxiety level in the experimental group suggests that HPBL did not simply reduce classroom anxiety during the intervention period. Throughout the projects, students remained actively involved in collaborative discussion, rehearsal, script preparation, recording, and speaking performance. Such speaking-oriented activities naturally involve communicative pressure, social visibility, and interactional demands commonly associated with FLCA (Horwitz et al., 1986). Previous studies have similarly emphasized that FLCA is dynamic and context-dependent rather than consistently reducible through a single instructional approach (Dewaele & MacIntyre, 2014; MacIntyre, 2017; Yu, 2022). In the present study, HPBL appeared to create both emotionally supportive and emotionally demanding experiences simultaneously. Compared with the experimental group, the control group demonstrated more stable or decreasing anxiety patterns across dimensions. Since both groups participated in collaborative PBL speaking projects with relatively similar stages of planning, discussion, rehearsal, and presentation, the findings may indicate that humor integration may have involved additional communicative and evaluative demands during classroom interaction. While collaborative speaking projects themselves may gradually reduce tension through repeated interaction and rehearsal, HPBL also required students to maintain humorous interaction, respond spontaneously, and become more aware of peer responses during communication.

One of the clearest findings of the study was the significant decrease in TA within the experimental group, which was accompanied by a large effect size. This result suggests that HPBL had a comparatively stronger influence on test-related anxiety than on the other dimensions of FLCA. The qualitative findings suggest that humor contributed to a more relaxed and less rigid classroom atmosphere during speaking activities. Students frequently described the classroom environment as more enjoyable, less tense, and less formal than conventional speaking classes. Humor also appeared to normalize mistakes and reduce pressure associated with formal classroom evaluation. Several participants explained that they became more comfortable participating in speaking activities because mistakes were treated as part of collaborative interaction rather than indicators of academic failure. These findings align with previous research suggesting that pedagogical humor may reduce emotional tension and support more psychologically comfortable language learning environments (Heidari-Shahreza, 2024; Mohammad Hosseini et al., 2022; St-Amand et al., 2024).

The collaborative structure of PBL may also help explain the decrease in TA. Students worked collectively during planning, rehearsal, recording, and project preparation, allowing emotional responsibility to be shared across group members rather than experienced individually. Peer support, collaborative rehearsal, and repeated interaction appeared to reduce pressure commonly associated with formal speaking assessment. This finding is consistent with collaborative learning perspectives emphasizing that teamwork and shared responsibility may help reduce individual performance pressure during speaking activities (Bozkurt & Aydin, 2023). Although the control group also demonstrated relatively stable TA, students in the experimental group more frequently described emotional relaxation, enjoyment, and reduced classroom rigidity during speaking activities. This may suggest that humor contributed specifically to reducing formal evaluative tension beyond the collaborative effects of PBL itself. This finding may also be interpreted through the lens of CVT. According to CVT, achievement emotions are influenced by learners' perceptions of control and the value attached to learning activities (Dewaele & MacIntyre, 2014). In the present study, humor appeared to reduce the perceived threat associated with speaking performance while increasing emotional comfort during classroom interaction. As a result, students may have experienced lower evaluative pressure during speaking activities, contributing to the reduction in TA.

In contrast, CA showed a significant decrease in the experimental group, accompanied by a medium effect size. The qualitative findings suggest that HPBL involved frequent use of English during collaborative speaking activities. Students participated in oral discussion, rehearsal, explanation, improvisation, and spontaneous interaction throughout the project process. Importantly, communicative participation extended beyond final performers because students in supporting roles also remained actively involved in collaborative oral interaction. Humor also appeared to encourage more spontaneous communication during speaking activities. Several students explained that humorous interaction required them to respond quickly, maintain conversational flow, and communicate more actively with peers. Although these conditions involved substantial communicative demands, repeated exposure to speaking activities and opportunities for collaborative rehearsal may have supported students' growing familiarity with English interaction. Previous studies have suggested that repeated oral participation and communicative exposure can shape students' experiences of speaking anxiety, particularly in interactive speaking environments (Aubrey, 2022; Bozkurt & Aydin, 2023; Yu, 2022). In this context, the decrease in CA may reflect students' increasing familiarity with communicative activities rather than reduced involvement in speaking participation. From a CDST perspective, this finding suggests that anxiety may fluctuate as learners respond to changing communicative and interactional conditions (Dewaele & Dewaele, 2020; MacIntyre, 2017). As students became more actively involved in discussion, rehearsal, improvisation, and collaborative speaking activities, their emotional experiences may have changed alongside their increasing familiarity with these communicative demands. CA therefore appeared to vary alongside changing interactional conditions rather than representing a stable individual characteristic.

The findings also revealed individual differences in how students experienced HPBL. While many students perceived humor as emotionally supportive, some participants continued experiencing tension during collaborative speaking tasks. One participant, for example, explained that he still felt uncomfortable speaking humorously in English despite the collaborative atmosphere. This finding suggests that humor did not affect all learners equally, highlighting the importance of considering learner characteristics in relation to the contexts in which language learning occurs (Dörnyei & Ryan, 2015). Students with lower speaking confidence or limited communicative readiness may continue experiencing pressure during humor-integrated speaking interaction (Dewaele & MacIntyre, 2014). This finding further supports perspectives viewing FLCA as dynamic and dependent on learners' communicative experiences and classroom interactional conditions. Similarly, FNE demonstrated significant within-group changes and significant between-group differences, both accompanied by moderate effect sizes. Based on the descriptive findings and interview data, students appeared to become more aware of audience reactions, peer judgment, and social evaluation during HPBL. Many participants expressed concern about whether their jokes would be understood, appreciated, or considered funny by classmates. Students also reported worry regarding audience response, awkward silence, and unsuccessful humorous interaction. These findings suggest that humor was associated with greater sensitivity toward peer evaluation and audience response during collaborative speaking activities.

Within HPBL, students were expected not only to communicate ideas in English but also to maintain audience engagement during interaction. Several participants additionally explained that humor required awareness of audience preferences and cultural sensitivity, which appeared to contribute to concerns regarding social appropriateness and peer interpretation. Previous research has similarly emphasized that FLCA is closely connected to peer response and classroom interactional dynamics (Horwitz et al., 1986; Yu, 2022). Compared with the control group, students in the experimental group therefore appeared to experience greater sensitivity toward audience reaction and interpersonal evaluation during speaking activities. This finding is consistent with CDST perspectives suggesting that emotional experiences are shaped by specific classroom interactions and contextual demands (Dewaele & Dewaele, 2020; MacIntyre, 2017). Overall, the findings indicate that HPBL influenced anxiety dimensions differently across speaking activities. While humor appeared to reduce formal evaluative pressure and support a more relaxed classroom atmosphere, it was also accompanied by communicative participation, interactional exposure, and awareness of audience response. Rather than uniformly reducing anxiety, HPBL appeared to reshape how anxiety was experienced across communicative and evaluative dimensions of classroom interaction.

Within this context, variability in learner experiences became an important finding. While many participants reported positive emotional experiences, this pattern was not universal. Importantly, the negative case of P13 provides further insight into this variability in emotional response. P13 consistently described sustained emotional discomfort across both rehearsal and collaborative speaking stages. He explained that he still "felt tense even during practice and rehearsal sessions," indicating that repeated exposure to collaborative speaking activities did not necessarily lead to emotional adaptation in his experience. This sustained tension may be understood in relation to his relatively limited perceived speaking confidence and communicative readiness, as indicated in his interview responses. Despite repeated exposure to collaborative speaking activities, he consistently reported difficulty in engaging comfortably during humor-based interaction. This suggests that HPBL may require a certain level of communicative readiness for learners to benefit from their affective and interactional support. In his case, humor did not appear to reduce emotional tension, but rather coexisted with feelings of discomfort during speaking activities, particularly when he was required to participate in real-time discussion and idea exchange. From a CDST perspective, this variation highlights that emotional experiences in language learning are not uniform but emerge from the interaction between learners' internal affective conditions and task-related demands. Rather than producing consistent emotional outcomes, HPBL appears to function differently depending on how learners negotiate communicative and interactional demands in real time.

Taken together, the quantitative and qualitative findings can be understood through the complementary perspectives of CDST and CVT. From a CDST perspective, these findings support the idea that FLCA may fluctuate across classroom situations, interactional demands, and collaborative experiences rather than remain stable throughout the learning process (Dewaele & MacIntyre, 2014; MacIntyre, 2017). Students' emotional experiences appeared to shift according to rehearsal processes, communicative participation, peer interaction, and audience response during the projects. In this sense, the findings support recent perspectives viewing FLCA as dynamic, context-dependent, and shaped by classroom interactional experiences rather than uniformly decreasing throughout instruction (Wang et al., 2024; Yu, 2024). At the same time, CVT may help explain why students frequently experienced enjoyment and anxiety simultaneously during HPBL (Dewaele & MacIntyre, 2014). Although humor was frequently associated with enjoyment and classroom comfort, students still perceived communicative performance and audience response as socially important during collaborative speaking interaction.

The present study also contributes to research on Humor Integrated Language Learning (HILL) by demonstrating that

HPBL may influence classroom anxiety in more complex ways than simple anxiety reduction (Heidari-Shahreza, 2024). Previous studies have highlighted the positive emotional effects of pedagogical humor, including creating a more relaxed classroom atmosphere, lowering affective barriers, fostering enjoyment, and supporting a more positive learning environment (Joudi & Ayoub, 2024; Tianli et al., 2024; Xiong et al., 2024). Previous research has also suggested that emotionally supportive and engaging classroom interaction may help students experience speaking activities more comfortably and participate more confidently during EFL communication (Xiong et al., 2024). However, the present findings suggest that humor may also be accompanied by greater communicative visibility and stronger awareness of peer response during collaborative speaking activities.

Several pedagogical implications may also be considered. HPBL may create engaging and collaborative speaking environments, but teachers may still need to provide sufficient communicative support during speaking activities. Gradual speaking exposure, collaborative rehearsal, supportive peer feedback, and psychologically safe classroom interaction may help students manage communicative and evaluative pressure during HPBL (Vygotsky, 1978). Teachers may additionally need to recognize that greater speaking nervousness does not necessarily indicate negative classroom engagement, particularly when students are simultaneously becoming more actively involved in oral interaction. Overall, the findings indicate that HPBL did not significantly reduce overall FLCA compared with PBL through a podcast project, and the effect size analysis suggested that the effect on overall anxiety was negligible. However, the intervention influenced the dimensions of anxiety in different ways. TA showed a significant decrease accompanied by a large effect size, whereas CA showed a significant decrease with a medium effect size, while FNE demonstrated a significant increase with a medium effect size. These findings suggest that humor may reduce anxiety related to formal assessment while simultaneously increasing learners' sensitivity to communicative performance, audience response, and peer evaluation during collaborative speaking activities. More broadly, the findings suggest that HPBL may create emotionally complex learning experiences in which enjoyment, nervousness, participation, and social evaluation coexist throughout classroom interaction.

5. Conclusion

This study found that HPBL influenced foreign language classroom anxiety differently across its dimensions. TA showed a 0.03-point decrease in the mean score ($r = .52$), while CA showed a 0.13-point decrease ($r = .40$). In contrast, FNE showed a 0.23-point increase ($r = .42$), while overall anxiety remained relatively stable. Rather than simply reducing anxiety, HPBL appeared to redistribute emotional pressure across communicative, evaluative, and social dimensions of speaking activities. Qualitative findings suggested that students perceived humor as creating a more relaxed and collaborative classroom atmosphere while increasing communicative exposure, audience awareness, and sensitivity to peer evaluation. The findings also indicate that humor did not affect all learners equally. While many participants perceived humor as emotionally supportive, some continued experiencing tension during HPBL, suggesting its emotional impact may vary according to speaking confidence, communicative readiness, and sensitivity to social evaluation. Overall, the study supports the view that FLCA is multidimensional, dynamic, and socially negotiated within collaborative EFL learning environments. Pedagogically, HPBL should be accompanied by supportive scaffolding, gradual speaking exposure, collaborative rehearsal, and psychologically safe classroom interaction to help students manage communicative and evaluative demands.

Limitations and Implications for Future Research

This study has several limitations. First, the quasi-experimental design employed intact classes rather than random assignment, so pre-existing differences between groups cannot be entirely excluded. Second, because the quantitative data violated some assumptions for parametric analyses, non-parametric statistical procedures were employed, which may have reduced statistical power. Third, the study involved non-English major university students at a single institution, limiting the generalizability of the findings. Future research should employ randomized experimental designs, include larger and more diverse samples, and examine HPBL across different educational contexts. Longitudinal studies are also needed to explore how different dimensions of foreign language classroom anxiety evolve during humor-based speaking interventions.

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Author contributions

Adhityo Kuncoro, S.S., M.Pd. conceived the research idea, designed and conducted the study, collected and analyzed the data, and was responsible for the overall research process. He also drafted the manuscript from the initial version through

the final revision, prepared the manuscript for submission, and coordinated the submission and revision processes. Syafi'ul Anam, Ph.D. provided substantial guidance on the study materials and theoretical framework, contributed to the interpretation of the findings, strengthened the analysis and discussion, and reviewed the statistical procedures and SPSS data analysis. Ahmad Munir, S.Pd., M.Ed., Ph.D. reviewed the manuscript and verified the accuracy of the SPSS data entry and statistical analysis to ensure that the reported results were consistent with the analysis. Tiffany Qorie, S.S., M.TCSOL. contributed to drafting and revising the manuscript, particularly in areas related to language education. All authors read and approved the final manuscript.

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Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Informed consent

Verbal informed consent was obtained from all participants before data collection.

Ethics approval

Not applicable. Permission to conduct the study was obtained from the Head of the Informatics Engineering Study Program at Universitas Indraprasta PGRI Jakarta.

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Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

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