

Beyond one-size-fits-all engagement: how EFL learners differ in generative AI-supported speaking practice

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Research Article

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Abstract

Generative artificial intelligence (generative AI) has created low-threat personalized environments for English speaking practice, but little has been known about how different EFL learners engage in generative AI-supported speaking practice. This study employs Q methodology to identify four distinct learner engagement profiles in generative AI-supported L2 speaking practice: relaxed regulators, detached doubters, anxious improvers and curious explorers. Although four profiles all exhibit salient emotional engagement, they differ greatly in their cognitive and behavioural engagement. Learners' appraisals of control and value shape different emotional experiences which may subsequently affect their cognitive appraisals and behavioural participation. Activating positive emotional experiences and activating negative emotional experiences may foster positive cognitive appraisals and behavioural engagement. Deactivating negative emotional experiences may undermine positive cognitive appraisals and inhibit behavioural engagement. Deactivating positive emotional experiences may inhibit deep cognitive engagement. This study reveals the heterogeneous and configurational nature of learner engagement in generative AI-supported speaking practice and offers pedagogical implications for tailored generative AI-supported speaking instructions.

1. Introduction

Against the backdrop of global wave of digital transformation, generative artificial intelligence (generative AI) is increasingly demonstrating substantial potential in the field of language education. Speaking instruction has long been constrained by a range of shortcomings such as lack of resources, authentic language environments and timely and individualized feedback (Fathi et al., 2024; Tran et al., 2024; Woreta et al., 2026). Applications such as virtual conversational agents, intelligent pronunciation evaluation systems and immersive scenarios simulations driven by intelligent speech recognition, natural language processing and generative artificial intelligence have broken the time and space restrictions and resource limitations of speaking learning, thereby facilitating personalized learning paths.

In generative AI-supported speaking practice, AI tools have been proved to influence and predict multiple dimensions of learner engagement, including emotional, cognitive and behavioural engagement (Yang, 2025). Existing literature often explores mediating effects and path analysis with emotional, cognitive and behavioural engagement as variables (Susoy, 2025; Wang and Wang, 2025), which is of great significance for revealing overall trends and predicting paths, but it is insufficient to capture individual learners' emotional, cognitive and behavioural engagement characteristics. Therefore, this study aims to identify different learner engagement profiles in generative AI-supported L2 speaking practice and learning by means of Q methodology so as to deepen the understanding of learner engagement in generative AI-supported L2 speaking practice and provide intervention strategies and practical guidance for generative AI-supported L2 speaking instructions.

2. Literature review

2.1 Research on generative AI-supported L2 speaking learning

In recent years, generative AI and conversational agents have created new opportunities for L2 speaking learning by providing timely feedback, personalized learning, and authentic-like speaking practice. While many studies have reported AI's potentials in improving speaking proficiency (Aljohani, 2026; Du and Daniel, 2024; Fathi et al., 2024; Jeon and Lee, 2024), evidence of learning gains still remains mixed across studies, partly due to differences in research designs, participants, and outcome measures (Meng and Zou, 2026). Moreover, some studies have suggested inaccurate or insufficiently personalized feedback and AI's limited capacity for emotional support and mentorship (Labadze et al., 2023).

However, existing researches have primarily taken quantitative approaches to report overall trends or group-level learning outcomes without giving sufficient attention to learners' individual perspectives and experiences in their speaking practice. A person-centred approach that foregrounds participants' subjectivity (Brown, 1980) is therefore needed to gain insight into the whole picture of generative AI-supported English speaking learning.

2.2 Research on L2 learners' emotional experiences in generative AI-supported speaking learning

Emotional experience constitutes one of the key factors influencing learning outcomes. The increasing use of conversational AI as a resource provider, evaluator, and feedback provider may shape learners' emotional experiences in ways that differ from those in traditional speaking instruction (Ji et al., 2023).

Existing research suggests that EFL learners experience diverse and sometimes contrasting emotions in generative AI-supported language learning. While many studies report positive experiences, including reduced anxiety (Tai and Chen, 2024; Wang et al., 2024) and enhanced self-efficacy (Zheng et al., 2025), motivation (Kohnke and Moorhouse, 2025), enjoyment (Yang and Zhao, 2024; Zhang et al., 2024) and their Willingness to Communicate (Fathi et al., 2024; Yuan, 2024). Others have reported negative experiences such as frustration, anxiety, pressure, boredom, embarrassment and fear (Xin and Derakhshan, 2025; Yang and Zhao, 2024; Guo and Wang, 2025). Moreover, Wang et al. (2025) found that EFL learners may perceive the same AI tools differently depending on their individual characteristics. Therefore, emotional experiences in generative AI-supported learning appear to be learner-dependant and dynamic (Guo and Wang, 2025; Zong and Yang, 2025).

Existing studies have largely examined discrete emotional variables in AI-supported speaking learning, whereas less is known about how individual learners' subjective experiences of AI are holistically configured.

2.3 Research on L2 learner engagement in generative AI-supported speaking learning

Learner engagement is commonly conceptualized as a multi-dimensional construct consisting of emotional, cognitive and behavioural dimensions (Fredricks, 2004). With the application of artificial intelligence in EFL education, there have been studies on the relationships between generative AI and learner engagement. First, a growing body of empirical studies have suggested AI learning tools can improve learners' overall engagement to varying degrees (Lee, 2025; Yuan and Liu, 2025; Wang and Xue, 2024). Additionally, existing studies have revealed inconsistent patterns of engagement in generative AI-supported learning, with some reporting stronger emotional and cognitive engagement but limited behavioural engagement (Guo and Wang, 2025), others finding enhanced emotional and behavioural but not cognitive engagement (Huang et al., 2026), and still others reporting moderate emotional but relatively low cognitive and behavioural engagement (Zhang, 2025). These findings have suggested learners' emotional, cognitive and behavioural engagement do not develop in a synchronous or linear manner, but they may exhibit different combinations when interacting with generative AI. Furthermore, emerging research suggests that emotional experiences play a central role in shaping learner engagement in generative AI-supported learning. Interest, enjoyment and belonging are found to sustain and facilitate cognitive and behavioural engagement (Lee, 2025; Zong and Yang, 2025). Emotional experiences have also been found to mediate the effects of generative AI use on engagement and influence cognitive processing and speaking performance (Dong et al., 2026; Wu et al., 2024).

Existing studies have examined engagement dimensions as separate constructs, offering limited insight into why learners may exhibit different combinations of engagement. Moreover, although emotional experiences have been linked to cognitive and behavioural engagement, it is still unclear whether different emotional experiences give rise to different patterns of cognitive and behavioural engagement.

3. Materials and Methods

3.1 Research questions

Based on the review of the relevant literature, this study seeks to explore the following two research questions:

1. What typical learner engagement profiles can be identified among university students in generative AI-supported English speaking learning?
- 2 How the identified learner engagement profiles differ in their emotional, cognitive and behavioural engagement configurations?

3.2 Participants

This study employed a purposive sampling and recruited 27 first-year undergraduate students (22 male and 5 female students with an average age of 19.04 years) from a science and engineering college in northern mainland China. The students were selected because they all had experiences practicing their speaking English with AI tools for at least one semester. The AI platforms and applications they had used for their practice included Doubao, the AI-supported speaking practice modules embedded in the

Chaoxing Learning Platform and Liulishuo English. All participants were adults (aged 18 years or above), participated voluntarily, and provided written consent before data collection. All data were collected and used anonymously to protect participants' privacy. This study was approved by the Research Ethics Reviewing Authority of the authors' institution.

3.3 Research methods and instruments

This study employed Q methodology, an approach proposed by William Stephenson in 1935, which aimed to investigate individual subjectivity and reveal shared types of viewpoints within a group by way of subjective sorting procedures and factor analysis (Stephenson, 1953). This study attempted to identify learner engagement profiles in generative AI-supported speaking learning, which was aligned with the fundamental purpose of Q methodology to explore individuals' subjective viewpoints and their potential configurations (Morea and Ghanbar, 2024). Post-sort semi-structured interviews were also conducted to explore participants' reasoning behind their ranking decisions, particularly for the statements at the extreme ends of the distribution and gain deeper insights into their viewpoints. As all participants were native Chinese speakers, Q-set questionnaires and post-sort interview questions were originally presented in Chinese, and then translated into English by the researchers for the purpose of peer review and publication.

3.4 Data collection procedures

This study followed the established procedures of Q methodology, including the development of the Q set, participant recruitment, Q sorting, post-sort interviews, and factor analysis (Brown, 1980; Watts and Stenner, 2005).

1. The development of the Q set. Consistent with the principle of Q methodology that the Q set should be broadly representative of the opinion domain at issue (Watts and Stenner, 2005), the Q set in this study was constructed to include as many typical viewpoints concerning learners' emotional, cognitive and behavioural engagement in generative AI-supported English speaking learning as possible. The viewpoints of the Q set were generated from three primary sources. First, relevant literature on learner engagement and emotional experiences in generative AI-supported English speaking learning was reviewed. Second, participants were invited to answer open-ended questions about their real experiences in the generative AI-supported speaking practice. Third, user comments and reviews from several widely used AI-powered speaking platforms and applications in China such as TalkAI, Liulishuo English and Keli and were collected and analysed. A total of 142 statements concerning learners' emotional cognitive and behavioural engagement were obtained from the above three sources. Then, semantically overlapping or redundant statements were either merged or removed. A final Q set of 47 representative statements was established. To avoid ambiguity during the Q-sorting process and identify distinct emotional-cognitive-behavioural engagement configurations, most statements were deliberately focused on one single dimension (i.e. emotional, cognitive, or behavioural) rather than including multiple dimensions within a single statement.

2)Q-sorting. Participants were given paper-based questionnaires and were asked to rank 47 statements from“strongly disagree”to “strongly agree”(– 5 to + 5) into a Q-sorting grid in a forced-distribution format (shown in Fig. 1), resulting in a symmetrical quasi-normal distribution. Finally, a total of 27 valid questionnaires were collected for factor analysis.

3. Factor extraction and interpretation. The researchers of this study entered the Q-sort data into KADE(Version1.3.1) and adopted principal component analysis(PCA) to extract factors and retain those whose eigenvalues greater than 1.00 and factor loadings with an absolute value of 0.38 or higher (significant factor loading= $2.58 \times \sqrt{N}$), N=the number of statements in the Q set. In this study, significant factor loading= $2.58 \times \sqrt{N}=0.376$) (Brown, 1980). Varimax rotation was subsequently applied to achieve a statistically acceptable and theoretically meaningful factors structure. In this study four factors were extracted with a total variance of 51% (see Table 1), which falls within the generally accepted range of 50–60% for Q methodological studies (Williams et al., 2010). The four-factor solution identified four distinguishable and interpretable learner engagement profiles. Post-sort semi-structured interviews were conducted with ten participants who exhibited high factor loadings on the extracted factors. The interviews lasted for approximately 195 minutes in total, and the audio recordings were transcribed into approximately 42071 Chinese words. The interviews serve to supplement the factor analysis by revealing the reasons behind the participants’ Q-sorts and distinctive characteristics of each factor, which are helpful to the understanding and interpreting of results (McKeown and Thomas, 2013)

Table 1
Results of Factor Analysis

Eigenvalue	Factor 1	Factor 2	Factor 3	Factor 4
	6.4374	3.1258	2.1746	1.9088
Explained Variance (%)	24	12	8	7
Cumulative Explained Variance (%)	24	36	44	51
Defining Q Sorts (n)	7	6	4	8

4. Results

Based on the results of factor analysis, participants’ distinguishing statements and post-sort semi-structured interview data, four typical learner engagement profiles were identified. The four-factor solution accounted for 51% of the total variance, which met the generally accepted criterion for cumulative explained variance in Q methodological studies. Therefore, the extracted factors could provide satisfactory interpretation for EFL learners’ subjective viewpoints on generative AI-supported English speaking learning. Based on significant factor loadings, 25 participants significantly loaded on one of the four factors, including seven on Factor 1, six on Factor 2, four on Factor 3, and eight on Factor 4. Two participants loaded significantly on at least two factors and were therefore considered cross-

loading Q sorts, so they were excluded from the interpretation of learner engagement profiles (Brown, 1980; Watts and Stenner, 2005).

4.1 Factor 1-Relaxed Regulators

As indicated by the extreme statements defining Factor 1 (see Table 2), relaxed regulators were characterized by a strong sense of relaxation and security in the generative AI-mediated low-judgemental environment at the emotional level (19,+5; 30,+4; 20,-5; 41, -4) and an ability of dynamic adjustment in the way they interact with generative AI at the behavioural level (35,+4). As the participant S6 in his post-sort interview noted,“I may ask AI tools to change the way it communicate so as to suit my preferences. For instance, if AI’s replies were too technical, I would ask it to use simpler language.” However, no salient cognitive engagement statements appeared among distinguishing statements of Factor 1, suggesting that cognitive processing and reflective thinking were not the most distinguishable characteristics of this factor.

Table 2
Extreme Statements for Factor 1

Q-Sort Value	Z Score	Statement
+ 5	1.52	19.Even when I make mistakes, I do not feel embarrassed by AI's corrections.
+ 4	1.51	30.When practicing with AI, I worry less about being evaluated negatively.
+ 4	1.48	35.I adjust the way I interact with AI to meet my own learning needs.
-5	-2.31	20.I often feel pressured by being evaluated when interacting with AI.
-4	-1.43	41.When AI repeatedly points out my pronunciation errors, I feel irritated and impatient.

4.2 Factor 2-Detached Doubters

The extreme statements of Factor 2 (see Table 3) revealed that detached doubters were primarily characterized by detached emotional experiences (39, + 5; 40, -5) and low emotional engagement (22, + 4) in generative AI-supported speaking practice. In the cognitive dimension, detached doubters demonstrated a sceptical and critical stance toward AI feedback (43, + 5; 4, + 4), and questioned the effectiveness of AI in assessing their real speaking proficiency and improving their speaking English performance (6,+4;40,-5). No behaviour-related statements emerged as the distinguishing statements of this factor. Post-sort interview data provided some insights into detached doubters’ behavioural engagement characteristics: passive use of AI tools or limited participation in generative AI-supported speaking practice. As participant S9 mentioned, “I only use AI tools to practice speaking English when my teacher asks me to.”

Table 3
Extreme Statements for Factor 2

Q-Sort Value	Z Score	Statement
+ 5	2.19	43.I critically evaluate the feedback provided by AI rather than accept it unconditionally.
+ 5	1.95	39.The impersonal and mechanical feedback provided by AI makes speaking practice feel less human and reduces my enthusiasm.
+ 4	1.56	3.I am not sure whether the feedback provided by AI is accurate.
+ 4	1.53	4.AI cannot accurately assess my actual speaking proficiency.
-5	-1.67	40.The speaking activities provided by AI help improve my speaking ability, making me feel confident and eager to practice.

4.3 Factor 3-Anxious Improvers

The extreme statements of Factor 3 (see Table 4) indicated these learners remained highly sensitive to AI feedback and scores (18,+5) and experienced fluctuated emotions (22, -4), suggesting they may experience anxiety in generative AI-supported speaking practice. They developed a clear cognitive appraisal of the value of generative AI in facilitating speaking learning (26,+4; 29,-5). They were inclined to adopt behavioural strategies focusing on improvement (1,+5) rather than experiment with different AI functions in their speaking practice (25,-4) .

Table 4
Extreme Statements for Factor 3

Q-Sort Value	Z Score	Statement
+ 5	2.16	18.I feel excited when AI gives me a high score.
+ 5	1.88	1.I repeatedly practice the areas that AI identifies as my weaknesses.
+ 4	1.53	26.I clearly understand how AI-based speaking practice benefits my English speaking learning.
-5	-2.61	29.I believe AI is more suitable for basic practice than for improving advanced speaking proficiency.
-4	-1.35	25.I try different AI features for speaking practice.
-4	-1.35	22.I do not experience noticeable emotional fluctuations when practicing speaking with AI.

4.4 Factor 4-Curious Explorers

As revealed by the extreme statements of Factor 4 (see Table 5), curious explorers exhibited positive emotional experiences driven by intrinsic interest and curiosity(46,+4) apart from relaxation in AI-mediated low-stress learning contexts (2,-5; 5,-5; 11,-4). In the cognitive dimension, learners displayed positive appraisals of AI in evaluating speaking proficiency (6,-4). They also demonstrated greater initiative and exploratory behaviours (45,+5). In contrast to relaxed regulators who were influenced by external factors, curious explorers were more inclined to interact with AI out of curiosity and interest and willing to explore more AI-supported learning approaches and opportunities.

Table 5
Extreme Statements for Factor 4

Q-Sort Value	Z Score	Statement
+ 5	1.7	45.I use different AI tools for speaking practice.
+ 4	1.24	46.Scenario-based conversations created by AI make speaking practice novel and increase my motivation to learn.
-5	-2.18	2.My emotions rise and fall with the scores given by AI.
-5	-2.06	5.Practicing speaking with AI makes me nervous.
-4	-1.69	11.I feel embarrassed when AI corrects my pronunciation.

5. Discussion

The present study adopted Q methodology to identify four learner engagement profiles in the generative AI-supported English speaking learning: namely relaxed relaxed regulators, detached doubters, anxious improvers and curious explorers. Based on a comparative analysis across the identified four learner engagement profiles, the present study yielded the following two major findings:

5.1 Emotional engagement is the central dimension of learner engagement in generative AI-supported English speaking practice

This study found that although all the four learner engagement profiles differ in their cognitive and behavioural engagement, they exhibited salient emotional engagement. This finding aligned with those of prior studies that emotional engagement served as a foundation for other dimensions of engagement (Guo and Wang, 2025; Lee, 2025), and a predictor of overall learner engagement (Henry and Thorsen, 2020). That is to say, learners’ emotional engagement largely affects their willingness to make further cognitive regulation and behavioural choices.

According to Control-Value Theory (CVT), individuals, subjective perceptions of control and appraisals of task value are key antecedents of emotional experiences (Pekrun, 2006). In this study, all of the four

learner profiles demonstrated salient but distinct emotional experiences which were closely associated with their perceptions of control and appraisals of the value of speaking tasks in generative AI-supported contexts. For instance, relaxed regulators could “adjust their interactions with AI to meet their own needs”, which demonstrated a high level of perceived control over their speaking practice process. Their relaxation and sense of security reflected in the statements of “not feeling embarrassed” and “feeling no pressure of being evaluated” while practicing with AI were attributed to their positive appraisals of the value of AI in the speaking learning contexts. According to Pekrun, the relaxed and secure emotions exhibited by Factor 1 are a type of deactivating positive emotions which have more complex effects on learners’ interest and motivation to learn (Pekrun, 2006). For curious explorers, “practicing with AI at any time and any place” and “practicing with different AI tools” reflected their relatively strong perceived control. Meanwhile, they expressed positive appraisals of the evaluative value of AI tools from the statement “AI can accurately assess my actual speaking proficiency”. This high degree of perceived control and positive appraisals give rise to positive activating emotions of “novelty” and “enjoyment” that are assumed to strengthen intrinsic and extrinsic motivation (Pekrun, 2006; Yu et al., 2022). Factor 3 anxious improvers displayed positive appraisals of the value of AI in improving speaking proficiency and the accuracy of AI feedback. However, “Their repeated practice of the weaknesses pointed out by AI” and “their reluctance to try other AI functions” suggested their low level of control over the practice content and learning pathways. Meanwhile, the particular attention of Factor 3 to AI feedback and scores revealed anxious emotions in these learners. Activating negative emotions (i.e. anxiety) can impair interest and intrinsic motivation while inducing extrinsic motivation to invest effort in order to avoid failures (Pekrun, 2006). Factor 2 detached doubters retained low level of perceived control over the accuracy of AI feedback. They also had negative appraisals of the value of AI in improving speaking proficiency. Consequently, this low level of perceived control and negative appraisals lead to deactivating negative emotions that are detrimental to learners’ intrinsic and extrinsic motivation.

Notably, although relaxed regulators and curious explorers shared positive emotional experiences, the positive emotional experiences of relaxed regulars were primarily triggered by the external low-pressure learning environment created by AI while those of curious explorers were driven by learners’ intrinsic motivation of novelty, interest and curiosity (Ryan and Deci, 2000). Ryan and Deci (2000) suggest that different types of motivation have specifiable consequences for learning, performance, personal experiences and well-being. Therefore, learners can exhibit distinct emotional, cognitive and behavioural engagement configurations.

5.2 EFL speaking learners’ differentiated emotional-cognitive-behavioural engagement in generative AI-supported contexts

This study found that emotional, cognitive and behavioural engagement do not necessarily occur in a symmetrical and synchronous manner. Instead, they combined in different patterns to form diverse engagement configurations. This finding is not entirely consistent with the previous researches that the three engagement dimensions are closely interconnected and tend to co-occur (Fredricks et al., 2004;

Hari & Flogie, 2025). It indicates that although these three dimensions are interrelated, they may also emerge as asynchronous and asymmetrical configurations.

In EFL learning, the fundamental role of emotions in affecting learners' engagement, motivation and overall academic performance has been well documented (Wang and Wang, 2023; Zong and Yang, 2025). According to Control-Value Theory, appraisals of control and values are central to the arousal of achievement emotions, which in turn affect the cognitive, motivational and regulatory processes mediating learning and achievement. Positive emotions can strengthen learners' intrinsic and extrinsic motivation, facilitate the use of learning strategies and self-regulation of learning while deactivating negative emotions, such as boredom and hopelessness, are held to be detrimental (Pekrun, 2006).

In this study, relaxed regulators exhibited deactivating positive emotions and self-regulated behavioural strategies. However, no distinguishing statements about cognitive engagement emerged. This finding resonates with Pekrun's view (Pekrun et al., 2002) that emotions such as relaxation can lead to decreased attention and superficial and more shallow, superficial processing of information. For relaxed regulators, AI tools may be taken as "non-judgemental practicing tools" and speaking practice may be perceived as a non-judgemental learning process that emphasizes practice rather than evaluation. Consequently, learners may remain at a relatively low level of cognitive engagement despite their positive emotional engagement.

Curious explorers exhibited activating positive emotions that were actually driven by intrinsic motivation which represented an inherent tendency to seek out novelty and challenges, to extend and exercise one's capacities, to explore, and to learn (Ryan and Deci, 2000). Consequently, they demonstrated active and exploratory behavioural engagement by "experimenting with different AI tools in their speaking practice". They also developed positive cognitive appraisals of both the instructional value and the evaluative value of AI. That is to say, curious explorers demonstrated salient emotional, cognitive and behavioural engagement.

Anxious improvers exhibited anxiety produced by external evaluation, such as AI-generated feedback and scores. According to Control-Value Theory, activating negative emotions like anxiety can impair interest and intrinsic motivation, while at the same time inducing extrinsic motivation to invest effort in order to avoid failures (Pekrun, 2006). Learners in this study chose to "repeatedly practice their weaknesses pointed out by AI" to achieve higher scores or improve their speaking performance. However, as Pekrun points out, anxiety may lead to the adoption of more rigid regulatory strategies like simple rehearsal which inhibit learners from voluntarily exploring more learning resources and ways of practicing. Therefore, anxious improvers demonstrated behavioural engagement characterized by targeted practice but limited exploration.

Contrary to the other three types of learners, detached doubters perceived AI tools as "lacking a human touch" and lacked anticipation and belief in the generative AI-supported speaking learning. They also demonstrated a strong critical and skeptical stance toward AI-generated feedback and the effectiveness of AI in improving speaking proficiency. No distinguishing statements emerged in behavioural

engagement dimension, which supports Pekrun's argument that deactivating negative emotions are detrimental to learners' motivation to learn (Pekrun, 2006). Deactivating negative emotional experiences may strengthen detached doubters' negative cognitive appraisals of generative AI-supported speaking learning and further inhibit their subsequent behavioural engagement.

5.3 Pedagogical Implications for Tailored Generative AI-supported Speaking Instructions

The present study identified four learner engagement profiles in generative AI-supported English speaking learning and they differed significantly in the emotional, cognitive and behavioural dimensions. The findings provide practical implications for English speaking instructions in the generative AI-supported learning environment.

First, teachers should pay particular attention to learners' emotional experiences and give priority to emotional support in the design of generative AI-supported speaking instruction (Pekrun, 2006). The non-judgemental feature of AI-supported speaking practice helps reduce the social evaluative pressure in interpersonal interactions. Therefore, teachers should maximize the advantages of low-pressure and low-threat speaking environment provided by AI and create emotionally supportive and interactive learning environments (Zong and Yang, 2025). In the beginning stage of speaking lessons, learners should be encouraged to interact with AI to build confidence and develop regular speaking habits. Once learners establish positive emotional experiences (Dong et al., 2026), they can be gradually introduced to interpersonal speaking activities, such as pair work and classroom presentations.

Furthermore, teachers should provide personalized teaching support tailored to different learner engagement profiles in the generative AI-integrated speaking instructions (Zhang, 2025; Zong and Yang, 2025). For relaxed regulators, teachers should maintain the low-threat and low-stress speaking learning environment while encouraging these learners to reflect on their interactions with AI through reflective journals and peer discussions to develop deeper cognitive engagement. For detached doubters, teachers should begin with engaging and interactive speaking games to foster positive emotional experiences with AI (Zong and Yang, 2025). They may also adopt progressive task designs that enable learners to start with speaking tasks with lower cognitive demands (Saqr, 2023). As they develop a stronger sense of control and competence (Wu et al., 2026), they can be introduced to more cognitively demanding and challenging tasks so as to gradually increase their behavioural engagement. For anxious improvers, teachers can help them set incremental learning goals for speaking improvement and guide them to achieve those goals on a gradual basis so as to increase learners' motivation for sustained engagement (Ryan and Deci, 2000). Meanwhile, teachers should also guide these learners to critically evaluate and rationally utilize AI-generated feedback, develop their meta-cognitive abilities, thereby relieving learners' anxiety caused by excessive emphasis on AI-generated feedback and scores (Wenden, 1998). For curious explorers, teachers should assign more creative speaking tasks with open-ended scenarios to maintain their motivation for autonomous exploration (Ryan & Deci, 2000). In the meantime, teachers can also encourage them to share what they have learned from their exploration in class to inspire their

peers. Being role models can further stimulate their intrinsic motivation and promote sustained engagement (Deci and Ryan, 2012).

5.4 Limitations

The present study has the following two limitations: first, the representativeness of the sample is limited. Participants in this study are recruited from a single university and do not include learners from diverse geographical regions or those with different ages, speaking proficiency levels and AI literacy (Bewersdorff et al., 2025; Zhang, 2025), which may limit the representativeness and generalizability of the findings. Second, this study captures learner engagement profiles from learners' subjective perspectives, but does not explore the possible evolution of these profiles during sustained learning (Saqr, 2023). Future research will expand the diversity of the sample. In addition, longitudinal research designs could be employed to investigate whether learner engagement profiles evolve over time or in different stages of speaking learning, thereby providing a more comprehensive picture of the dynamics of learner engagement in generative AI-supported L2 speaking learning.

6. Conclusion

Using Q methodology, the present study identified four distinct learner engagement profiles in generative AI-supported English speaking learning: relaxed regulators, detached doubters, anxious improvers and curious explorers. Comparative analysis across the identified learner engagement profiles further reveals that all engagement profiles exhibit salient emotional engagement. However, different emotional experiences may affect learners' cognitive and behavioural engagement. Both activating positive emotional experiences and activating negative emotional experiences (e.g., anxiety) may foster positive cognitive appraisals and behavioural engagement. Deactivating negative emotional experiences may undermine positive cognitive appraisals and inhibit behavioural engagement. Deactivating positive emotional experiences (e.g., relaxation) may inhibit deep cognitive engagement. The findings of the present study provide some implications for speaking instructions in generative AI-supported learning contexts. Teacher guidance is of particular importance in learning environment integrated with generative AI (Godwin-Jones, 2026). Teachers should pay full attention to learners' distinct emotional experiences and provide tailored teaching guidance for different learner profiles (Saqr, 2023) so as to effectively promote learners' sustained engagement in L2 speaking learning.

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Figures

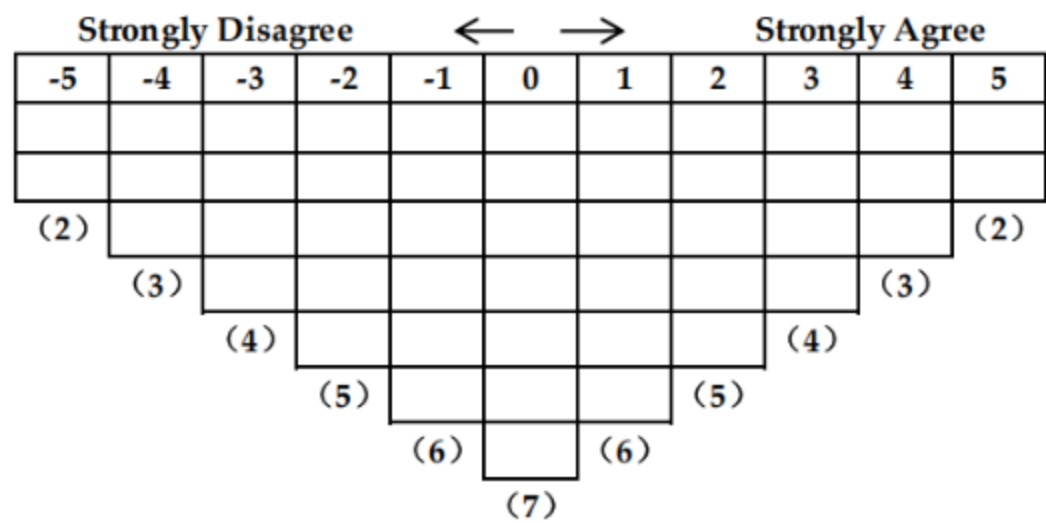


Figure 1

Q-sort grid