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Factors Influencing Engagement in Project-Based Learning Among College EFL Speakers

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Abstract. There has been a surge in the popularity of project-based learning (PBL) as an instructional approach in foreign language education. However, despite the increasing body of research on students' engagement in PBL, the focus on exploring engagement in PBL from a multi-dimensional perspective remains limited. Based on Reeve's student engagement framework, an explanatory mixed methods design was employed to evaluate college English as a Foreign Language (EFL) speakers' engagement (behavioural, emotional, cognitive and agentic) and elucidate the factors influencing engagement in PBL. For this study, 151 students from a polytechnic in China were recruited as participants, and a questionnaire was employed to examine the four dimensions of engagement in PBL among them. Additionally, semi-structured interviews were conducted with 10 students to understand their perspectives on how PBL has impacted their engagement levels. An analysis of the questionnaire data by descriptive statistics revealed that behavioural engagement ranked highest, followed by emotional, cognitive and agentic engagement. The interview data, analysed by thematic analysis, identified the factors influencing the four engagement dimensions of PBL, which were then categorised as positive (e.g., interest, group dynamics, topics and task types, etc.) and negative (e.g., weak English proficiency, introverted personality, fear of failure, etc.) factors. The findings provided insights into the four types of engagement and the factors influencing these dimensions. This study has educational implications for foreign language teachers as it will help them to find ways to engage college EFL students in PBL speaking activities and optimise the PBL environment.

Keywords: student engagement; four engagement dimensions; project-based learning; English speaking

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1. Introduction

Project-based learning (PBL) is gaining increasing attention as a pedagogical approach in English language teaching. PBL aims to steer students toward intricate problems, creating a conducive environment for inquiry-driven investigation and comprehension (Zen et al., 2022). PBL provides an enhanced learning environment, encouraging students to actively and reflectively engage by allowing them to chart their course using various resources and opportunities. Its implementation in English as a Foreign Language (EFL) classrooms has proven beneficial, significantly enhancing students' language proficiency, communicative and collaborative skills and critical and problem-solving abilities, as well as positively influencing learning attitudes, self-efficacy, motivation, autonomy and research skills (Mohamad & Tamer, 2021; Hastuti, 2022; Leow & Neo, 2023). However, the implementation of PBL has encountered various challenges, including the fact that students experience confusion and a lack of clarity about their next steps in the process (Kłeczek et al., 2020). Students in PBL classrooms transition from being active collaborators to adopting roles such as 'team escapers' and 'free riders' (Zheng et al., 2022). A study by Yong and Saad (2023) revealed that students in a PBL class perceived the project work as time-consuming and challenging. These challenges suggest that the implementation of PBL may result in unsatisfactory and ineffective outcomes.

The implementation of PBL is ineffective without the active involvement and commitment of students to activities. Understanding students' engagement within and outside the classroom is imperative. Previous studies on engagement have primarily adopted a tripartite framework of behavioural, cognitive and affective engagement (Fredricks et al., 2004; Phothongsunan, 2020) to investigate students' responses to teachers' instructions. However, Reeve and Tseng (2011) argued that this tripartite framework is incomplete and proposed four different interdependent engagement constructs, adding agency as an important new aspect. They argued that students exhibit behavioural, emotional, cognitive and agentic engagement in their educational endeavours, which can be used to predict their academic accomplishments (Reeve & Tseng, 2011). Student engagement has substantial and positive correlations with English achievement in the domain of college English education (Liu et al., 2023), and students that engage in learning activities achieve greater academic success compared to those who do not actively participate (Schnitzler et al., 2021).

Various factors affect the extent of student engagement, with existing research delineating these factors into the internal and external categories. The internal factors include variables like self-efficacy, objectives, apprehension of failure and positive emotion (Mercer, 2019; Aubrey et al., 2020; Sulis, 2022), while the external factors encompass teachers' enthusiasm, group cohesion, school environment and family background (Dewaele & Li, 2021; Li & Xue, 2023). However, no in-depth studies have explored the factors influencing students' engagement in PBL within the EFL context by adopting the framework of behaviour, emotion, cognition and agency.

In an effort to address this disparity, the current study aimed to examine the four dimensions of this framework and scrutinise the factors impacting each dimension in PBL. The research questions that guided this exploration are delineated as follows:
1) To what extent do EFL students self-report their behavioural, emotional, cognitive and agentic engagement in PBL?
2) What are the factors contributing to EFL students' behavioural, emotional, cognitive and agentic engagement in PBL?

2. Literature Review

2.1 Student Engagement

The concept of student engagement finds its roots in the notion of school engagement, as established by Fredricks et al. (2004). Student engagement is defined as the proactive and constructive participation of students in educational endeavours (Fredricks et al., 2019). An essential characteristic of student engagement is its multifaceted nature (Christenson et al., 2012), which encompasses behavioural, cognitive and emotional dimensions (Fredricks et al., 2004). With the advancement of engagement research, Reeve and Tseng (2011) introduced the fourth dimension of engagement—agentic engagement—conceptualised as an ongoing series of interactive transactions between students and teachers. For the current study, Reeve's (2012) student engagement, which centres around the concept of student engagement and draws on the principles of student engagement theory, was adopted as the theoretical framework (Figure 1). The theoretical framework proposes that student engagement comprises four distinct yet interconnected aspects: behavioural, emotional, cognitive and agentic engagement.

Behavioural engagement is characterised by students' concentrated attention, sustained effort and prolonged involvement in tasks. Key elements influencing behavioural engagement include affective states, group dynamics, peer familiarity and task preferences (Jin et al., 2022; Phung, 2021). Emotional engagement is defined as the presence of emotions that facilitate tasks and the absence of emotions that hinder tasks. The development of emotional engagement is influenced by various social and contextual factors associated with peers, teachers and tasks (Dewaele & MacIntyre, 2014; Luan et al., 2023). Cognitive engagement entails the application of advanced, profound and individualised learning strategies and prioritising the pursuit of conceptual comprehension over surface-level knowledge. Teacher support, peer group characteristics and intellectually challenging tasks have been identified as significant factors that shape cognitive engagement (Nenning et al., 2023). Agentic engagement involves actively contributing to the progression of a learning activity and the degree to which learning is enhanced rather than passively receiving knowledge. Several factors affect the probability of agentic engagement, including teacher-related factors like encouragement or discouragement and student-related factors such as personality (Zambrano et al., 2022). This framework of student engagement served as the guide for investigating the levels of EFL speakers' engagement in PBL and the factors influencing student engagement in China.

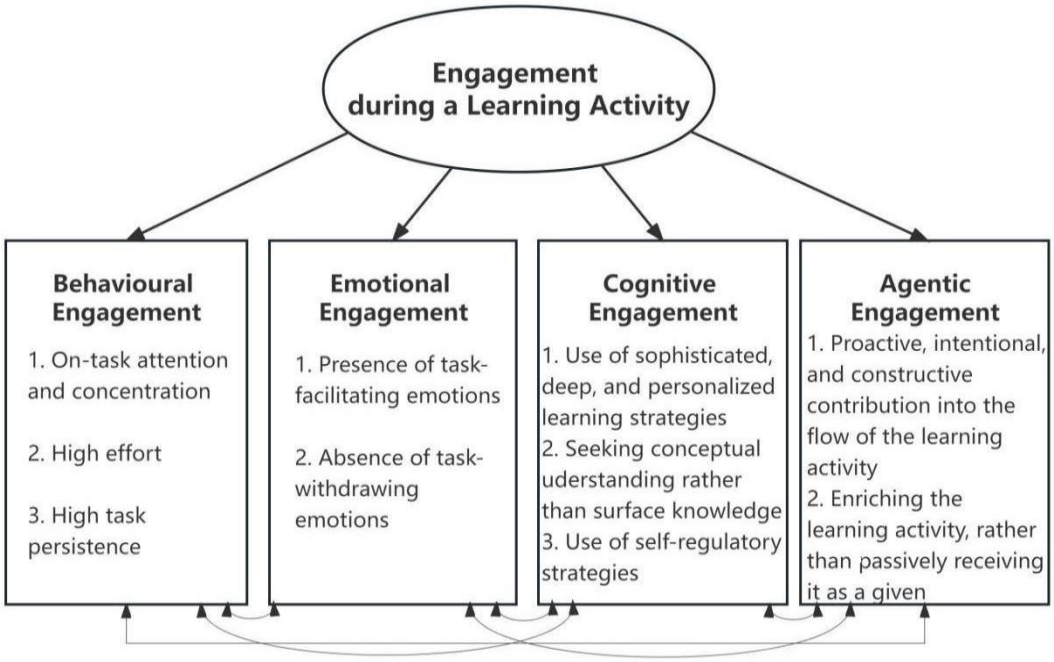

Figure 1: Engagement during a Learning Activity (Reeve, 2012)

2.2 Student Engagement in PBL

PBL is an instructional approach that encourages students to actively construct their knowledge within a collaborative group setting, facilitated by a tutor or teacher serving as a mediator (Amamou & Cheniti-Belcadhi, 2018). Earlier research on student engagement and PBL focused primarily on two key aspects—evaluating the effectiveness of PBL in enhancing student engagement and examining the factors affecting engagement.

A growing body of research has examined the effects of student engagement on PBL in different subject domains. Halvorsen et al. (2019) conducted a study involving students in a social studies venture focused on historical events and figures. Their research indicated that the adoption of PBL positively impacted students' learning, fostering engagement among both students and teachers. Carrabba and Farmer (2018) noted an improvement in student engagement in PBL in a science class compared to direct instructional methods. Zen et al. (2022) observed that the PBL approach created an enjoyable learning environment, influencing student engagement and supporting the entrepreneurial learning processes. In the EFL context, Putri (2018) reported that the utilisation of PBL has the potential to augment students' earning process. Park and Eisenhower (2019) found a significant increase in positive perceptions of PBL among EFL college students taking language learning classes, which implies that student engagement improved after implementing PBL. Zhao et al. (2023) reported that integrating blended learning and PBL significantly affected college English students' behavioural, cognitive and emotional engagement. These studies all indicated that student engagement was enhanced following PBL implementation. However, research on student engagement in PBL within the EFL context remains limited.

An increasing number of studies are concentrating on the factors affecting student engagement in PBL. Recent studies on the factors affecting student engagement have primarily approached the subject from the psychological and sociological perspectives (Dong & Liu, 2020). Liu and Zuo (2022) suggested that the effectiveness of PBL cannot be separated from each group member's active engagement, which is influenced by multiple factors, including the number of professional terms, the quality of online discussions, topic interest and group leadership. Zheng et al. (2022) highlighted various factors contributing to changes in engagement, including students' language proficiency, their learning needs and the type of activity. According to Aubrey (2022), the perpetuation of engagement is facilitated by the presence of conditions akin to the state of flow during tasks, the establishment of group cohesion among project members and a strong emphasis on the overarching long-term objective of the project. These studies investigated various factors as potential indicators of general engagement in PBL. However, there is a scarcity of empirical research on the elements contributing to student engagement in PBL within the framework that encompasses these four dimensions: behaviour, emotion, cognition and agency.

Based on previous research, the extent to which college EFL speakers participate in PBL and the factors the support or impede the four engagement dimensions remain unclear. To address this gap in knowledge, this study was conducted to investigate college EFL speakers' engagement (in four dimensions) and the factors affecting the four dimensions of engagement in PBL.

3. Methodology

3.1 Research Design

An explanatory mixed-method design was utilised for this study. This design combines quantitative and qualitative methods, with an initial phase and a subsequent qualitative phase which provide insights and explanations for results obtained from the quantitative analysis (Creswell, 2017). In this study, the quantitative phase was implemented to examine the degree of the four engagement dimensions in PBL, while the qualitative phase was used to explore the factors affecting the four dimensions of engagement in order to truly understand college EFL students' engagement in PBL.

3.2 Participants

For the quantitative phase, the participants were purposefully chosen from a polytechnic in China. The homogeneous cohort comprised 151 first-year EFL learners who enrolled in English-speaking courses applying the PBL method. All participants major in English education and were aged between 17 and 20 years. The participants, consisting of 145 females and six males, were exclusively native speakers of Mandarin Chinese. The participants' English scores in the Nation Matriculation Test (NMT) ranged from 54 to 126, with an average score of 93.6 out of 150.

In the qualitative phase, 10 participants deemed capable of providing comprehensive interview responses were purposefully selected from the 151 participants for interviews. As outlined in Table 1, all participants were female

and aged between 17 and 20 years. Their English scores in the NMT ranged from 56 to 107, with an average score of 90.8 out of 150. Pseudonyms were allocated to the participants to ensure confidentiality.

Table 1: Participants' Profile

Pseudonyms	Gender	Age	English Score (The total score: 150)
Lin	Female	18	96
Chen	Female	18	57
Wang	Female	18	104
Li	Female	18	95
Yang	Female	17	85
Tan	Female	18	80
Huang	Female	19	97
Wei	Female	18	88
He	Female	18	99
Zhang	Female	20	107

3.3 Research Instrument

A questionnaire and semi-structured interviews were employed as the tools for data collection in this study. While the questionnaire offers insights into patterns within extensive populations, the qualitative interviews contribute a more in-depth understanding of participants' attitudes, thoughts and actions (Harri & Brown, 2019).

The questionnaire was administered with the objective of assessing the level of student engagement after the implementation of PBL. For the assessment, the Student Classroom Engagement (SCE) scale developed by Reeve (2013), which encompasses the emotional, behavioural, cognitive and agentic engagement dimensions, was employed. The SCE scale comprises a total of 19 items, with five items each dedicated to the emotional, behavioural and agentic engagement domains and four items specifically addressing the cognitive engagement domain. Completing the questionnaire took 10-20 minutes. Respondents self-evaluated their degree of classroom engagement on a five-point Likert scale (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree). This questionnaire included two sections. The first section focused on gathering participants' basic information, including gender, age and English scores in NMT, while the second section encompassed the SCE scale. For enhanced user friendliness, the SCE scale (English version) was translated into Chinese by two English teachers proficient in both languages. Discrepancies that emerged in the translations underwent thorough deliberation until a consensus was reached.

Following the distribution of the questionnaire, semi-structured interviews were conducted to explore the determinants of student engagement. The interview questions were related to respondents' basic information and the factors influencing the four dimensions of engagement. In alignment with the distinct definitions of each dimension of engagement, four questions were formulated for each type. The questions were reviewed and validated by two subject-field experts before the interviews were conducted. These interview questions were

originally constructed in English, before subsequently being translated into Chinese. English back-translations were performed by the two English teachers to ensure uniformity in translation.

3.5 Data Analysis

The data derived from the participants' responses to the questionnaire were analysed using SPSS 27.0. An initial reliability assessment was performed to gauge the internal consistency of the questionnaire. The Cronbach's alpha coefficients for behavioural, emotional, cognitive and agentic engagement were computed as .921, .949, .937 and .916, respectively. These values falling between 0 and 1 indicate that the questionnaire has good reliability. Subsequently, descriptive statistical analyses were employed to present a comprehensive summary of the data on the four facets of engagement.

To explore the second research question, the interview data was examined using Nvivo 12, employing thematic analysis in accordance with the six-step framework outlined by Braun and Clarke (2006). This process involved familiarisation with the data, generation of initial codes, identification of categories or themes, scrutiny and refinement of the identified themes and, ultimately, the synthesis of the findings into a comprehensive report. Two proficient raters, both adept in thematic analysis, were tasked with coding the interview data. Any discrepancies that emerged during the coding process were diligently addressed through deliberative discussions until a consensus was reached.

4. Results

4.1 Levels of Engagement in PBL

A descriptive quantitative analysis was employed to assess the mean (M) and standard deviation (SD) of the four aspects of student engagement, with the findings delineated in Tables 2 and 3.

Table 2 reveals the mean and standard deviation of the items encompassing behavioural, agentic, cognitive and emotional engagement within the context of PBL. Notably, Item 4 underscored the participants' commitment to exerting maximum effort, exhibiting the highest mean score (M=4.225) among the 19 items surveyed. Conversely, Item 8, which pertained to the expression of preferences and opinions, recorded the lowest mean score (M=3.450). Nevertheless, students continued to actively participate in the PBL environment.
Table 3 reveals that behavioural engagement attained the highest mean (M=4.041), followed by emotional engagement (M=3.885) and cognitive engagement (M=3.846); conversely, agentic engagement recorded the lowest mean (M=3.548). Notably, all four aspects of student engagement garnered mean scores indicative of responses ranging from slightly agree to agree. Furthermore, students exhibited the highest engagement behaviourally, with comparatively lower engagement in the agentic domain. The marginal discrepancy between the highest and lowest mean scores reveals slightly divergent responses for behavioural (SD=.722) and agentic (SD=.762) engagement. Consequently, the results indicate that students are primarily involved in behavioural engagement

during PBL activities, with subsequent levels of engagement observed in the emotional, cognitive and agentic dimensions. The results also demonstrate that the combined influence of behavioural, emotional, cognitive and agentic engagement promotes proactive learning within the domain of EFL speaking.

Table 2: The mean and standard deviation of the four engagement dimensions

Engagement	Mean	Std. Deviation
Behavioural Engagement		
1. When I'm in this class, I listen very carefully.	4.166	.706
2. I pay attention in this class.	4.013	.702
3. I try hard to do well in this class.	3.874	.760
4. In this class, I work as hard as I can.	4.225	.675
5. When I'm in this class, I participate in class discussions.	3.927	.767
Agentic Engagement		
6. I let my teacher know what I need and want.	3.609	.766
7. I let my teacher know what I am interested in.	3.523	.738
8. During this class, I express my preferences and opinions.	3.450	.754
9. During class, I ask questions to help me learn.	3.603	.817
10. When I need something in this class, I'll ask the teacher for it.	3.556	.736
Cognitive Engagement		
11. When I study for this class, I try to connect what I am learning with my own experiences.	3.907	.743
12. I try to make all the different ideas fit together and make sense when I study for this class.	3.834	.752
13. When doing work for this class, I try to relate what I'm learning to what I already know.	3.874	.742
14. I make up my own examples to help me understand the important concept I study for this class.	3.768	.725
Emotional Engagement		
15. When we work on something in this class, I feel interested.	3.834	.770
16. This class is fun.	3.841	.792
17. I enjoy learning new things in this class.	4.026	.739
18. When I'm in this class, I feel good.	3.868	.806
19. When we work on something in this class, I get involved.	3.854	.778

Table 3. The cumulative mean and standard deviation of the four dimensions

	Behavioural	Agentic	Cognitive	Emotional
Mean	4.041	3.548	3.846	3.885
Std. Deviation	.722	.762	.741	.777

4.2 Factors Influencing Engagement in PBL

This section expounds upon the findings of the inquiry into the factors identified by participants as impacting their behavioural, emotional, cognitive and agentic engagement within the PBL context. The factors influencing each engagement dimension were methodically categorised into two principal groups, following the data analysis: positive and negative factors (Figure 2). To facilitate a systematic presentation, the four facets of engagement have been distinctly expounded upon.

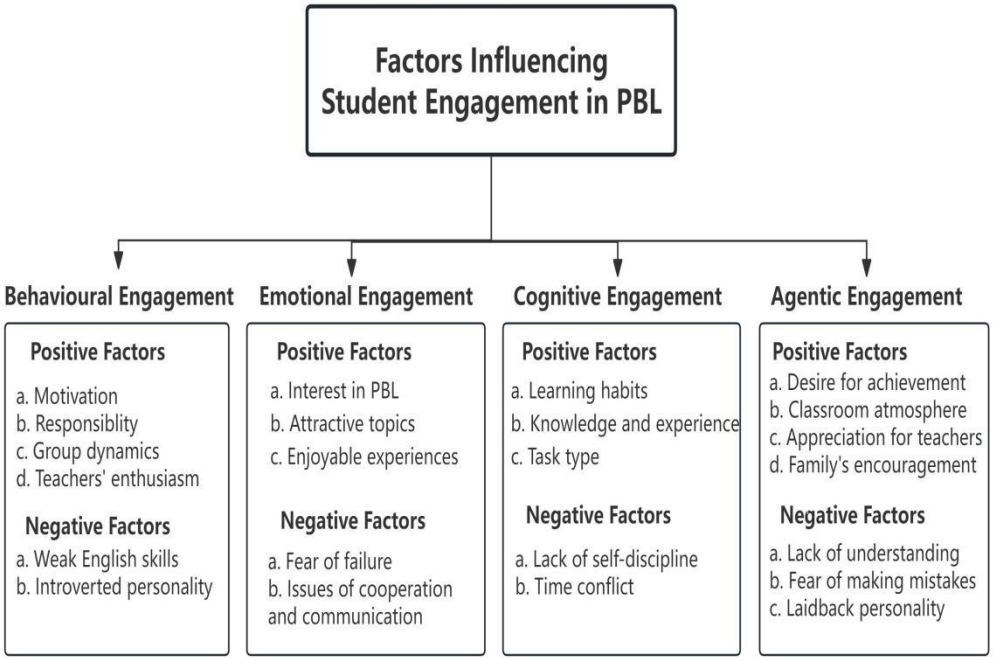

Figure 2: Factors influencing student engagement in PBL

4.2.1 Behavioural engagement

The positive elements that were found to contribute to behavioural engagement include motivation, a sense of responsibility, favourable group dynamics and the enthusiasm exhibited by teachers. Conversely, negative factors were linked to inadequate proficiency in English and introverted personality traits.

(a) Positive factors. Intrinsic motivation emerged as a positive factor contributing to behavioural engagement in project-based classes. Five participants explicitly communicated their motivation, highlighting the connection between their future careers and their present commitment to project work. Wei stated, "*I want to be a good English teacher in the future, so this motivates me to learn and excel in this project*." Additionally, Wei and Zhang have realised the ability of PBL to enhance their speaking and social skills, demonstrating an intrinsic motivation to engage in PBL. As reported by Wei, "*I find this project to be beneficial…Our future careers may involve teaching, so this project make us improve our fluency in spoken English*." Zhang noted, "*The project helped me refine and enhance my social skills*." Collectively, these instances underscore the pivotal role of motivation in sustaining heightened behavioural engagement in the context of PBL.

A sense of responsibility exerted a notable effect on students' perseverance in undertaking project-related tasks. Three participants explicitly conveyed their commitment to fulfilling their designated roles. Chen articulated, "*Since it's a group project, if I don' t do my part, it affects the progress for everyone*." Lin emphasised that performing individual tasks not only enhanced their sense of responsibility but also heightened their personal sense of duty. The

acknowledgment of responsibility prompted group members to recognize their importance in achieving a common goal and apply effort in group tasks.

Group dynamics emerged as a crucial factor that enhanced students' behavioural engagement, with four participants attributing their high level of engagement in PBL to group dynamics. Li noted, "*My group members are all great, and they are very enthusiastic about participating in these activities. Their enthusiasm rubs off on me and motivates me to get involved*." Lin underscored the eagerness of the group to complete tasks and achieve optimal results, emphasising that team spirit served as motivation for active participation. The enthusiasm and team spirit exhibited by group members within the dynamics significantly impacted their effort and engagement in PBL.

Additionally, teachers' enthusiasm was highlighted by three participants as a catalyst for their heightened attention and dedication to completing tasks. Li remarked, "*I enjoy the teacher's classes, and that enthusiasm carries over into my dedication to completing these tasks*." The enthusiasm demonstrated by teachers in the classroom served as a motivational force, prompting students to focus and concentrate more on achieving their learning goals.

(b) Negative factors. Inadequate proficiency in English emerged as a central impediment to participants' behavioural engagement in PBL. Five participants acknowledged that their limited English skills hindered their ability to concentrate and persist in PBL activities. Chen elucidated, "*I feel that my English skills are quite weak, and I've only done a little, which hasn't met the team's expectations of effort*." Insufficient English proficiency constrained students' capacity to focus and put sustained effort in PBL.

Students' introverted personalities were identified as another factor impeding engagement in PBL. Four participants articulated their belief that personality traits influenced student engagement in learning activities. Yang disclosed that some group members exhibited introverted tendencies, resulting in a reduced participation in group discussions and interactions. Tan reiterated this point, stating that, "*If someone is not brave enough or is shy about interacting with others, it may hinder their participation in interviews*." These instances collectively underscore the fact that introverted or shy students tend to engage less in both classroom and extracurricular activities.

4.2.2 Emotional engagement

The evaluation of emotional engagement focused on the presence of task-supportive emotions (interest and enjoyment) and the absence of task-impeding emotions (non-interest and anxiety). Positive factors affecting emotional engagement included interest in PBL, appealing topics and enjoyable experiences. Conversely, negative factors included fear of failure and challenges in cooperation and communication.

(a) Positive factors. Interest in PBL emerged as a significant contributor to emotional engagement. Five participants explicitly expressed their interest in PBL. For instance, Wang mentioned, "*I'm very interested in the project, and I enjoy PBL.*" Tan underscored the importance of enjoying the project and interview

work, noting that a lack of interest could lead to boredom and diminished effort. The interest generated by PBL was perceived as instrumental in fostering task-supportive emotions among students in the PBL classroom.

Another factor influencing emotional engagement in PBL is the selection of topics that captivate students' interest, motivating their active participation. Five students articulated their preference for engaging with topics that piqued their interest. One expressed the opinion that interesting topics prompted them to offer unique perspectives and expressions. Yang elaborated on this, stating that "*The topics related to popular trends or things that are currently popular online would likely capture students' interest.*" The incorporation of compelling topics was found to stimulate emotional engagement in the EFL-speaking classroom.
Additionally, the enjoyment derived from experiential learning was the third factor found to contribute to students' emotional engagement in project-based activities. Four students reported that they derived pleasure from their involvement in executing projects. Wang mentioned, "*I find interviews very interesting. We can get in touch with senior students from different departments. That's what I find enjoyable.*" Furthermore, three students expressed enjoyment in using English in their daily lives. Lin stated that using English to express themselves during interviews added an interesting dimension to the experience. These instances underscore how students derive satisfaction from the unique and immersive experience of using English in an authentic environment, thereby enhancing their emotional engagement.

(b) Negative factors. Factors impeding emotional engagement included apprehension due to the fear of failure, challenges in cooperation and communication and limitations in knowledge and English proficiency. Eight participants articulated concerns and anxieties regarding their performance and achievement, fearing that they might fall short of their desired standards. Lin detailed these fears, stating, "*First and foremost, it's the fear of not doing enough, and then the fear of stumbling or experiencing hesitation during the interview process, which can make the overall presentation appear less smooth. Third, it's the fear that my pronunciation and language fluency may not be up to par while expressing myself.*" Such apprehensions and worries among students impeded their emotional engagement.

Issues regarding cooperation and communication were reported by five participants as influential in diminishing their interest in the PBL process. Zhang expounded on this, explaining, "*One factor that can affect my interest is if my group members don't cooperate. If I'm the group leader and assign tasks but they don't do them, it can lower my interest in the project.*" Furthermore, Chen highlighted problems in communication, expressing that difficulties in communication could reduce her interest. Challenges arising from inadequate cooperation and communication within group dynamics were found to diminish students' concentration, effort and persistence in completing projects.

Limited knowledge and English proficiency emerged as a third negative factor, potentially causing anxiety and diminishing students' interest. Five students indicated that their insufficient knowledge of and proficiency in English could

undermine their effort, focus and interest in learning. Zhang remarked, "*Another factor is my own lack of knowledge in certain areas. I haven't put in enough effort to understand them, and this can make me anxious*." Chen conveyed, "*I'm not good at speaking or don't know how to express myself. It might hinder my interest in oral communication*." Insufficient knowledge and low English proficiency were identified as factors with the potential to negatively impact students' perseverance in tasks within the EFL-speaking classroom.

4.2.3 Cognitive engagement

Cognitive engagement was assessed based on the deployment of advanced learning strategies, an inclination toward conceptual comprehension over superficial knowledge and the application of self-regulatory strategies. The determinants influencing cognitive engagement were further classified into affirmative aspects, including learning habits, pre-existing knowledge and experience and task type. Conversely, negative factors encompassed deficiencies in self-discipline and conflicts regarding time management.

(a) Positive factors. Learning habits emerged as a primary factor influencing students' adoption of learning strategies, with five participants establishing a connection between their learning habits and the utilisation of strategies in the PBL class. Yang exemplified this by stating, "*I tend to rephrase other people's questions or answers because it helps me remember. It's a habit of mine*." Additionally, Huang reported, "*I might forget the content after class. So, I use these strategies to reinforce my understanding and retention*." This underscores the diverse strategies students employ based on their learning habits.

The second influential factor in students' inclination toward conceptual understanding, rather than surface knowledge, is pre-existing knowledge and experience. Four students indicated that their preference for deep learning strategies was influenced by their prior knowledge and experiences. Chen explained, "*I use the association strategy because I have prior knowledge in that area, so I can relate new information to what I already know*." Similarly, Li mentioned, "*I also link the questions from my group members or interviewees to past and present experiences to enhance my interviews and project completion.*" This implies that students' existing knowledge and experiences play a pivotal role in determining their ability to employ deep learning strategies and seek conceptual understanding.

The third factor identified by three participants as contributing to students' utilisation of sophisticated learning strategies in PBL is the nature of the task. When asked about the factors influencing her learning strategies, Wang identified the specific task assigned to her for a project as a primary determinant. Wang further clarified with examples, stating, "*For instance, if my task is text editing, I follow the plan I've created for this specific job. If my role is to conduct interviews for the project, I discuss the interview questions with the team members responsible for text editing. We then select different interviewees for the interviews. My learning approach is influenced by the types of each project task*." This explains how the nature of different tasks influences the choice of learning strategies.

(b) Negative factors. The primary inhibiting factor identified was a lack of self-discipline, with five students expressing the view that they do not possess a strong sense of self-discipline, resulting in their inability to engage in self-regulated learning. Yang articulated this concern, stating, "*Self-discipline is a significant factor. My self-discipline is somewhat lacking, as I can easily be distracted by other people's activities.*" This underscores the pivotal role of students' self-discipline in determining their capacity for independent study.

Another factor identified as contributing to the decline in self-regulated learning was time conflict, with four students citing conflicts in time arrangements as a hindrance to their ability to regulate their study habits. Tan explained, "*It might be more related to external factors, such as conflicts between my plans and external arrangements. If something interferes with my plans, I might not be able to complete my learning tasks on time.*" This implies that conflicts in time allocation pose a barrier to the implementation of self-regulated learning. Addressing and coordinating time effectively becomes crucial to resolving this impediment.

4.2.4 Agentic engagement

Agentic engagement was evaluated based on active and constructive participation in the learning process, emphasising a contribution that enriches the learning experience rather than a passive reception of information. Positive factors found to be associated with agentic engagement included a desire for achievement, classroom atmosphere and appreciation for teacher and family's encouragement. Conversely, negative factors included a lack of understanding, fear of making mistakes and a laidback personality.

(a) Positive factors. The desire for achievement emerged as a positive factor, identified by five participants. Li articulated her aspiration to excel academically, achieve commendable results and not disappoint her parents. Similarly, Huang expressed her ambition, stating, "*I want to achieve even better results in the future.*" This shows how students' positive aspirations contribute to a more enriched learning experience.

The second factor identified as fostering active student participation in PBL was the classroom atmosphere, as emphasised by four students. They concurred that a proactive and interactive classroom environment encourages learning. Li commended the interactive nature of her class, stating, "*The classroom atmosphere is interactive, with the teacher posing questions and many students participating actively, which motivates me to respond*." Wang explained that the frequent and active engagement of her classmates created an environment where students are compelled to participate actively. This highlights the significant positive effect of an interactive and supportive learning atmosphere on student engagement.

Appreciation for teachers was identified as another factor contributing to high agentic engagement, as reported by four students. He reported, "*I appreciate the teacher's good and interesting personality. He is very accommodating and provides me with opportunities to practice, which also motivates me*." This highlights the impact of recognition for teachers on students' willingness to actively contribute to the learning process.

Encouragement from family also emerged as a contributing factor to active student participation, as indicated by three students. Li explained, "*When I was at home, they always encouraged me to study well. Even when I'm at school, they occasionally call me and might offer rewards or incentives for good performance, both material and motivational. They provide verbal encouragement as well.*" This demonstrates the importance of familial support and encouragement in promoting students' active engagement in their learning endeavours.

(b) Negative factors. The impediments to agentic engagement which were identified include a lack of understanding, the fear of making mistakes and a laidback personality. Regarding a lack of understanding, five students expressed that they experienced anxiety in such situations. Tan conveyed, "*If the teacher is teaching something and I don' t understand, it may hinder my ability to respond.*" Both Yang and Zhang acknowledged a dynamic where their level of activity in class was influenced by their comprehension; they tended to be more proactive when they had a better understanding. This underscores how limitations in understanding can constrain students from actively contributing to their learning activities.

The second factor identified was the fear of making mistakes during interactions with teachers, as identified by four students, who expressed concerns about making mistakes while actively participating in class. Zhang noted, "*It could be because of shyness or fear of making mistakes, which might lead to concerns about embarrassment or what the teacher might think.*" This highlights how affective states, such as the fear of making mistakes, can impact students' willingness to actively engage in classroom interactions.

A laidback personality was the third factor found to influence students' contribution to learning, with four students acknowledging that their personalities hindered them from being active learners. Li attributed her reluctance to initiate conversations or actively engage with others to her introverted and less proactive nature. She stated, "*It's a matter of personality. I'm somewhat introverted and not very proactive in initiating conversations with others. Even with classmates, I usually wait for someone to approach me before I respond; otherwise, I don't initiate communication.*" This emphasises how a laidback personality may result in students preferring passive reception over active participation in the learning process.

5. Discussion

This study aimed to investigate the extent of behavioural, emotional, cognitive and agentic engagement in PBL among students in EFL-speaking classes. The results indicate that behavioural engagement in PBL attained the highest level, followed by emotional, cognitive and agentic engagement. These findings are congruent with the existing literature, positioning behavioural involvement as a paramount element of student engagement (Kashif & Basharat, 2014). Additionally, these findings are in accordance with those of Benlahcene and Awang-Hashim (2021), who highlighted that students' engagement (spanning

the behavioural, emotional, cognitive and agentic domains) contributes to the establishment of a more conducive learning environment.

This study delved deeper into the determinants of the four facets of engagement to understand the exhibition of engagement within the context of PBL. Behavioural engagement in PBL was reported to be the most prevalent among the four aspects of engagement. It is indicated by concentration, effort and persistence. This study demonstrated that shifts in behavioural engagement are contingent on the amalgamation of positive elements, including motivation, responsibility, group dynamics and teachers' enthusiasm. Students in PBL environment concentrate on authentic PBL tasks for which they have a strong interest and intrinsic motivation. Students in the PBL environment concentrated on authentic PBL tasks for the strong interest in PBL and intrinsic motivation. It was also observed that a sense of responsibility towards task completion promoted students' engagement in PBL and that group dynamics and the enthusiasm of teachers played pivotal roles in encouraging students to engage extensively in PBL activities, resulting in high levels of effort and persistence. Students in PBL classes were motivated to interact with team members through discussions and brainstorming sessions, which led to increased active engagement in learning activities (Lai, 2021). According to Yong and Saad (2023), teachers' enthusiasm plays a significant role in shaping students' engagement in class. These findings are similar to Mali's (2016) study, which revealed that communication, teamwork and a sense of responsibility were key factors in the successful completion of a project. Conversely, factors, such as deficient English proficiency and introverted personality traits, were identified as impediments to student engagement. Students who perceive themselves as less proficient in English tend to become disengaged in pair activities (Zheng et al., 2022). Individual personality characteristics also affect student engagement (Li & Xue, 2023). The restrictions arise from the fact that Chinese college EFL students struggle with expressing themselves effectively, especially in the English language. As a result, they stay quiet and fail to participate in PBL activities. The current study's findings align with those of prior research on the factors promoting and hindering behavioural engagement in PBL activities (e.g., Skinner & Brule, 2014; Shlankar & Hu, 2021).

Emotional engagement in PBL ranked as the second most prevalent dimension among the four dimensions of engagement. It is related to the presence of facilitating emotions and the absence of withdrawing emotions. Positive determinants of emotional engagement are associated with a confluence of factors such as interest in PBL, interesting topics and enjoyable experiences. PBL allows students decide how to approach and complete projects, further igniting their enthusiasm for achieving meaningful results. In the current study, captivating topics and enjoyable experiences tied to authentic activities exerted a substantial influence on students' interest and satisfaction during their engagement in PBL. These findings are in line with those of prior research, underscoring the significance of factors such as interest in PBL (Hermans & Prins, 2022), interesting topics (Liu & Zuo, 2022) and enjoyable experiences (Plung et al., 2021) in shaping students' emotional experiences during learning

activities. Conversely, the fear of failure and challenges in cooperation emerged as hindrances to students' overall engagement in the learning process. College students who fear failure find it challenging to undertake new learning activities, hindering their emotional involvement in PBL. Additionally, collaboration is one of the challenging aspects of PBL, which could potentially impact students' involvement in learning (Hussein, 2021). Regarding these challenges, some students held the view that effective communication could be a key factor in overcoming them and ensuring successful collaborative learning in PBL.

Cognitive engagement is followed by emotional engagement, ranking third among the four dimensions of engagement. It pertains to use of deep learning strategies and self-regulatory strategies. The factors influencing this dimension were classified into positive and negative elements. The positive elements include learning habits, prior knowledge and experiences and task type. In the PBL environment, students have the opportunity to employ diverse profound learning strategies, leveraging their individual learning habits, pre-existing knowledge and personal experiences to enhance their comprehension. The influence of students' learning habits and prior experiences on their profound engagement in learning activities has been underscored in the work of Li and Xue (2023). Notably, research by Zheng et al. (2022) indicated that the type of activity, as a contextual factor, can positively impact cognitive engagement. Simultaneously, challenges arose as students encountered difficulties in effectively regulating their learning processes, which was attributable to a deficiency in self-discipline and time constraints. According to Krskova et al. (2020), achieving a balance between self-discipline and effective time management is crucial for fostering a profound dedication to any given activity. Consequently, students who cannot manage their time well and stick to their learning plans are less cognitively engaged in PBL activities.

Within the PBL setting, agentic engagement demonstrated the lowest prevalence when juxtaposed with the other three forms of engagement. It makes a constructive contribution to the flow of learning and enriches the learning process. Various factors were found to exert a greater influence on students' agentic engagement in facilitating the learning process during PBL, including the desire for achievement, classroom atmosphere, appreciation for teachers and encouragement from family. Li and Xue (2023) reported that the provision of environmental support could significantly impact students' desire to actively participate in learning endeavours. PBL provides a constructive environment for students to contribute to the learning process through collaborative, cooperative and authentic learning. In PBL classes, a robust desire for achievement is suggested to drive students to actively interact with educators and assume an active learner role within the PBL classroom. The appreciation for teachers in PBL could directly influence students' agentic engagement in the classes. Encouragement from family could also promote students' participation in learning activities. These findings align with Pigford's (2022) proposition that when examining agentic engagement, it is important to consider students' social environments, including their interactions with their instructors and family.

However, lack of understanding, the fear of making mistakes and a laidback personality greatly hinder students' agentic engagement within the PBL classroom. A subset of respondents in the interviews expressed a preference for attentively listening rather than actively participating in PBL classes, despite acknowledging the importance of being more involved in learning activities. A possible reason for these limitations could be the familiarity of Chinese students with traditional classes, where they were accustomed to passive listening. As a result, they might not have fully adjusted to this innovative communicative teaching approach. In the PBL class in this study, while majority of the students made efforts to seize opportunities for active participation in learning activities, some were still reserved and engaged with the learning content passively. These findings are in line with those of Gray's and DiLoreto' (2016) study, which proposed that self-confidence, personality traits and attitudes collectively shape agentic engagement.

6. Conclusion, Limitation and Future Research

This study aimed to assess the levels of behavioural, cognitive, emotional and agentic engagement within project-based EFL-speaking classrooms, while also assessing the factors influencing each of these facets of engagement. The findings demonstrate that PBL could more effectively improve behavioural engagement in EFL-speaking courses but less effectively enhance agentic engagement. The factors found to influence the four engagement dimensions were classified as positive and negative factors. The results of this research not only confirm the application of the student engagement theory within the domain of English language teaching in China but also broaden it, creating opportunities for applying the theory to various subjects and diverse educational settings and offering valuable insights for enhancing student engagement in different disciplines. The study also provides foreign language teachers with comprehensive insights into the levels of the four dimensions of student engagement and the factors influencing these dimensions. This information can help teachers optimise PBL activities and create an environment that enhances student engagement in EFL-speaking classes. Consequently, improvements in students' English speaking proficiency are expected, which will contribute to the development of internationally competitive talents across various industries in China, making a significant impact on society.

The present study has several limitations, which are avenues for future research. First, data were gathered through a self-report survey and semi-structured interviews. The fact that only two methods were adopted to correct the data may have introduced potential biases and subjectivity. Future research endeavours could enhance data triangulation by incorporating additional sources. Diverse research paradigms, including observations and reflective journals, could be employed to offer a more comprehensive understanding of students' learning processes and outcomes.

Additionally, it is noteworthy that all the data were obtained from students registered for the same course at a polytechnic in China. Besides, 10 female students had been interviewed for their perceptions of factors affecting student

engagement in PBL. The singular institutional context and student groups might affect the generalisability of the results. Subsequent studies could address this limitation by broadening their samples to involve mixed-gender students and extending the study to diverse subjects and institutions. Moreover, future studies could explore student engagement in PBL from teachers' perspectives. These recommendations would result in a more comprehensive exploration of student engagement within the context of PBL.

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