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Effective Teacher Questioning Perceived by EFL Learners in Chinese Universities and Its Relationship with Classroom Engagement

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Abstract: *The use of effective questioning by teachers is a key component in teaching English as a Foreign Language (EFL) because it influences how students participate in classroom activities. However, the underlying mechanism between questioning and student engagement is underexplored. This research, which takes a sociocultural perspective, seeks to expand our understanding of what EFL students in Chinese universities consider to be effective teacher questioning and how it relates to their engagement in the classroom. A questionnaire was given to 1064 English learners at seven universities in China to find out their views on their English teachers' questioning techniques and how these techniques affect their engagement in learning. The findings indicated that the questioning contents, questioning ways and responding ways were seen as quite effective, but the questioning effect was seen as less so. Moreover, the study found that effective questioning by teachers had a strong influence on student engagement in the classroom. The content, methods, and effects of the teachers' questions were all linked positively to the students' level of engagement in learning English. These findings provide a deeper insight into what Chinese EFL students perceive as effective questioning and could help to enhance their engagement in learning.*

Keywords: *Sociocultural perspective; Effective teacher questioning; EFL learners; Student engagement*

1. Introduction

Institutions of higher education are currently confronted with the imperative to execute pedagogical approaches that bolster student empowerment and self-directed learning, while simultaneously cultivating their capacities for critical analysis and active engagement [1]. Within the context of language education, language is concurrently the subject of learning and the objective to be mastered. Engaging in classroom interaction is particularly pivotal in this scenario, as it provides learners with vital linguistic data and the chance to exercise their skills in the target language [2]. The significance is amplified in the realm of English as a Foreign Language (EFL) instruction, where English serves as a learned entity but is not commonly utilized in daily life, a situation prevalent in numerous global contexts. While students are typically devoid of opportunities to engage in English-mediated face-to-face interactions beyond the classroom setting, the emphasis on their proficiency in English communication is pronounced, particularly at the universities. This is coupled with a growing awareness that English, as the global lingua franca, is a key facilitator for both national advancement and the realization of individual life ambitions [3]. Under such circumstance, the act of college English teachers' questioning is recognized as a pivotal element in facilitating effective instruction and teacher-student interaction, given its capacity to influence the extent of student engagement in classroom discourse [4]. Teachers' effective classroom questioning is fundamental in amplifying the educational experience and fostering a deeper level of engagement during classroom interactions, thereby significantly contributing to the enhancement of student learning outcomes [5]. But the underlying mechanism between effective teacher questioning and students' engagement is an issue yet to be addressed. Upon this, the present study focuses on Chinese EFL teachers' questions, a critical factor that influences the students' propensity for communication or their tendency towards reticence [6], exploring how EFL teachers' effective questioning can affect student engagement in the classroom.

Previous research on language pedagogy's questioning methods often dichotomizes teachers' questions based on their efficacy in nurturing interaction conducive to language learning, labeling them as either effective or ineffective [5]. Nonetheless, there is a dearth of understanding regarding the perceived effectiveness of teachers' questions among EFL learners in China. To bridge this knowledge gap, the present study advocates for a shift in research focus from the assessment of question types'

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effectiveness in learning to an evaluation of the practical effectiveness of university teachers' questioning strategies within the EFL classroom setting in China. Moreover, while existing literature indicates that effective questioning by teachers can significantly boost student engagement [4], there is a scarcity of research that delves into the mechanisms underlying this influence. Additionally, most studies have adopted qualitative approaches to examine the impact of teachers' effective questioning [7], with a relative paucity of quantitative research in this domain. Consequently, this study introduces a novel quantitative perspective by surveying Chinese university students' perceptions of the effectiveness of their English teachers' questioning and their level of engagement in English classes. Through this quantitative assessment, the research aims to shed new light on the relationship between effective teacher questioning and student engagement. By emphasizing a sociocultural viewpoint that underscores the significance of social interaction in the learning process, this study endeavors to make a substantial contribution to the comprehension of questioning as an educational instrument in EFL classrooms and its relationship with student engagement. The study is designed to elucidate the current state of effective teacher questioning in China and to explore its potential effects on student engagement, with the goal of offering insightful implications for pedagogical strategies within analogous educational contexts.

2. Sociocultural Perspective and Teacher Questioning

Investigations into classroom dialogue are congruent with sociocultural theories of pedagogy, which regard learning as an engagement in communal practices [9]. Globally, educational frameworks have underscored the significance of classroom teaching as a collaborative endeavor, through which students cultivate the competencies to pose questions, construct arguments, and substantiate their perspectives. Scholars across diverse settings have chronicled the strategies by which educators employ questioning to forge classroom environments abundant with dialogue, conceptual understanding, and a distribution of authority between teachers and learners. From a sociocultural perspective, interaction is essential because the acquisition of language is inherently a cooperative endeavor. Within this process, learners are provided with 'scaffolding' by more knowledgeable others, enabling them to accomplish tasks beyond their unaided capabilities and, over time, progress towards linguistic proficiency [10].

In educational settings, teachers employ a spectrum of questioning techniques, spanning from simple questions aimed at information retrieval to intricate questions designed to explore students' analytical processes or promote the articulation of reasoning. The nature of these questions has the capacity to elicit various interactive dynamics between students and teachers. Mehan [11] initially characterized a prevalent classroom interaction model termed initiation-response-evaluation (IRE), a construct also recognized as the initiation-response-feedback (IRF) paradigm [12]. Subsequent research has extended the IRF paradigm to delineate additional interaction patterns, such as funneling and focusing interactions [13]. Categorizing the types of questions posed by teachers is instrumental for deciphering the mechanisms by which educators utilize classroom discourse to instill classroom protocols and delineate conversational expectations within an academic environment.

3. Literature Review

3.1 Effective Teacher Questioning

Employing questions as a means of instruction has a long-standing history and has been a fundamental element of educational practices for many centuries. Teachers frequently utilize questions to evaluate the cognitive grasp of their students. Strategically and effectively employed, questioning serves to actively involve students in the educational experience, facilitating their journey toward a more profound comprehension of complex ideas, fostering collaborative interactions among peers, and bolstering their self-confidence [14]. Effective classroom questioning, often hailed as the "core of effective teaching," can be succinctly defined as the act of posing questions in an effective manner. It consists of two dimensions: the effectiveness of the questions themselves and the effective questioning strategies. The effectiveness of classroom questioning should be pursued in terms of both efficiency and benefit, with varying standards depending on the perspectives used to assess it. Teachers' implementing classroom questioning can be divided into three stages: posing questions, obtaining answers, and providing effective feedback [15]. Ma [16] has proposed evaluative criteria for the effectiveness of classroom questioning by English teachers from the perspectives of teachers and students. The criteria included four dimensions: questioning contents, questioning ways, responding ways, and questioning effects. Specifically, according to Ma [16], the effectiveness of questioning contents refers to the teacher's ability to pose

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effective questions to students based on the teaching contents, facilitating classroom interaction and dialogue, thereby achieving a unity between the preset and emergent aspects of questioning. The effectiveness of questioning ways refers to the teacher's capability to employ a diversified language, clearly pose questions to all students, and provide ample waiting time for students' responses. The effectiveness of responding ways refers to the teacher's provision of timely and targeted feedback on students' answers, utilizing various feedback techniques to guide students towards deeper levels of thinking, and encouraging students to question boldly and innovate. The effectiveness of the questioning effects refers to a combination of achieving teaching objectives and teacher-student joint development through teacher questioning, reflecting the teacher's teaching characteristics in high-quality classroom teaching.

3.2 Student Engagement

The concept of student engagement is widely recognized as a multifaceted phenomenon, with a consensus among scholars regarding the tripartite framework proposed by Fredricks et al. [17]. This framework delineates student engagement into three core dimensions: behavioral, emotional, and cognitive. Behavioral engagement, as characterized by Fredricks et al. [17], pertains to the active involvement of students in academic tasks that demand effort and perseverance, as well as their participation in extracurricular activities. Students exhibiting high levels of behavioral engagement are typically proactive in classroom endeavors and demonstrate a desire to excel. Emotional engagement is defined by the affective responses of students, encompassing a spectrum of emotions such as interest, pride, and even boredom or concern within the educational environment. Pupils with a strong emotional connection to their school and academic pursuits are said to possess elevated affective engagement. Cognitive engagement, on the other hand, relates to the strategic approaches students employ in their learning processes, which are underpinned by self-regulatory and metacognitive competencies. These include the abilities to plan, monitor, and appraise the learning experience. Students with robust cognitive engagement are inclined to embrace challenges, exhibit adaptability in problem-solving, and recognize the significance of school-based learning as a foundation for future preparedness.

3.3 Teacher Questioning and Student Engagement

Historically, educational research has predominantly focused on a learning-oriented perspective regarding teacher questioning, prioritizing the efficacy of such questions in fostering learning opportunities. The analytical framework most frequently employed differentiates between 'referential' and 'display' questions, a concept introduced by Long and Sato [18]. Referential questions are designed to elicit information that is unknown to the teacher, thus promoting interactive communication. In contrast, display questions are posed to assess students' knowledge of pre-determined answers, with the intent of evaluation rather than genuine dialogue. In addition to the referential-display categorization, another prevalent distinction is drawn between 'open' questions, which encourage diverse responses and cognitive reasoning, and 'closed' questions, which limit thought by acknowledging only a single correct response. It is commonly accepted that open or referential questions are instrumental in establishing interactive environments that are conducive to language acquisition. On the other hand, closed or display questions are perceived to perpetuate the IRE (Initiation-Response-Evaluation) sequence, characterized by students providing concise answers that are immediately followed by the teacher's evaluative feedback, thereby concluding the interaction and potentially hindering opportunities for meaningful learning [19]. However, scholars posit that display questions fulfill distinct communicative functions within the classroom setting, and it is considered hasty to dismiss display questions without first examining their intended educational roles [20]. Furthermore, the dichotomy between display and referential questions is recognized as reflecting varied instructional approaches, each aligned with specific pedagogical objectives.

Furthermore, existing literature included a spectrum of questioning categories that can be arranged along a continuum, ranging from higher-order to lower-order categories. Lower-order questions are characterized by their demand for straightforward or brief responses, including those that elicit yes or no responses, requests for elucidation, inquiries about procedures, or prompts for the recollection of facts [21]. In contrast, higher-order questions are distinguished by their necessity for more elaborate answers and their imposition of greater cognitive challenges upon students, consisting of types that demand analysis, evaluation, exposition, and comparison [21].

Teachers frequently employ questions that are designed to elicit a specific response, a practice often observed in Initiation-Response-Evaluation (IRE) sequences. This pedagogical approach can significantly influence the extent to which students are able to engage in classroom discussions. In

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scenarios where such questions are utilized, it is common for teachers to allocate minimal waiting time and to solicit responses primarily from those students who proactively offer to contribute to the conversation [22]. Utilizing linguistic analysis to scrutinize the dynamics of teacher-student exchanges within geometry classrooms, the research conducted by González and DeJarnette [23] identified a pivotal distinction between two approaches of teacher questioning. The first approach involves teachers posing questions with a predetermined answer, while the second entails the introduction of open-ended questions that leave the response domain to the students' discretion. In the context of a final unit review, it was observed that teachers inclined towards lower-order questions; notwithstanding, the employment of questions with greater authenticity was found to enhance students' autonomy, particularly in steering the direction of the review session [23]. In scenarios where small groups were engaged in tackling open-ended tasks, teachers were noted to predominantly employ initiation questions. Such questions functioned as a scaffolding, facilitating student progress when they encountered obstacles [24]. In these cases, these lower-level questions were recognized to fulfill a social scaffolding role to ensure the continuity of student engagement and their access to essential concepts.

Researchers have explored the changes in the level of teacher questioning over time, although there is a relative scarcity of studies documenting this change. The study by Aydogan Yenmez et al. [25] found that teachers initially posed mostly directive and procedural questions (lower-level), but after reviewing lesson plans and engaging in modeling activities, they incorporated more broadening questions (higher-level). In Di Teodoro et al.'s [26] research, teachers increased their asking of deeper questions from 25% to 69% within the action research project. This study showed that by improving questioning skills, the level of student engagement and the quality and quantity of student questions were enhanced, indicating that changes in the way teachers ask questions can directly affect the students' learning experience.

Furthermore, teachers adjust the type of questions they ask based on the students' responses. If a student provided a correct answer, the teacher would pose more complex higher-order questions. If a student answered incorrectly, the teacher would pose lower-order questions to maintain student engagement and help them gradually improve their level of thinking.

Alongside the observation that teachers modify their questioning in response to students' answers, it has been indicated that the impact of teachers' questions on facilitating or limiting students' opportunities to reply should also be considered. In a study by Aziza [27], the practices of a primary school teacher were examined, and the teacher explained her reasons for using either closed or open-ended questions. During one lesson, she predominantly utilized closed questions, mentioning that they were sometimes intended to encourage students to contemplate the question's content, such as stimulating thought about a technical term's definition. Conversely, open-ended questions, though less commonly employed, fostered students' creative thinking. In a more extensive investigation, Ni et al. [28] elucidated how the use of higher-level and lower-level questions influenced student responses in Chinese reform-oriented upper-elementary classrooms. Analyzing data from 90 classroom observations across 30 different teachers, the researchers discovered a positive link between teachers' lower-order questions and students providing "simple answers." In contrast, a correlation was observed between higher-order questions and students offering "highly participatory answers." Additionally, it was highlighted that within this study's scope, the higher-order questions posed by teachers were associated with tasks that demanded more advanced cognitive engagement, whereas lower-order questions were linked to exploring various methods for solving problems. It is posited that the use of lower-order questions to elicit diverse solution strategies served as a type of social scaffolding, which supported student engagement but may not consistently aid them in processing information.

Furthermore, beyond employing lower-level questions to act as social scaffolding, studies within educational psychology have indicated that "retrieval questions," which demand that students recall information they already know, can be beneficial to learning. In Fazio's [29] research, data from various middle school classrooms were examined to track the prevalence of such retrieval questions among teachers. The findings revealed that 42% of teachers' questions fell into this category, with questions related to semantics and procedures being the most frequently utilized.

Additionally, in technology-rich environments, the way in which teachers pose questions also affect students' engagement. Cayton et al. [30] observed that the teacher who utilized GeoGebra (a popular dynamic mathematics software) as a "partner" tended to pose a higher frequency of probing questions which are formulated to elicit elaboration on students' preliminary answers and are typically introduced after a student's reaction to the initial stimulus provided by an educator, as opposed to the other instructors who predominantly employed questions of a procedural or factual nature.

Expanding upon the existing literature, the objective of the current study was to investigate the

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effective teacher questions perceived by EFL learners in Chinese universities and its relationship with EFL learners' classroom engagement. This research aims to answer the following two research questions:

(1) What is the status of effective teacher questioning perceived by EFL learners in Chinese universities?

(2) How is effective teacher questioning related to EFL learners' classroom engagement?

4. Methodology

4.1 Participants

An investigation, facilitated by an online survey, was conducted between June and July 2023, leveraging the researchers' networks Chinese universities. The study engaged a convenience sample of 1,064 English as a Foreign Language (EFL) learners from seven universities. Participants were assured of the confidentiality and voluntary nature of their involvement. As delineated in Table 1, which outlines the demographic details, 828 (77.82%) participants were female, while 236 (22.18%) were male. Regarding the university type, 380 students (35.71%) were from public universities, and 684 (64.29%) were from private universities. The academic distribution within the sample was as follows: 398 (37.41%) were first-year students, 189 (17.76%) were second-year students, 245 (23.03%) were third-year students, and 232 (21.80%) were in their final year of undergraduate studies. 892 (83.83%) students were pursuing majors in the social sciences and humanities, 143 (13.44%) participants were enrolled in science and engineering programs, and 29 (2.73%) students were studying medicine. It is of particular interest that all participants were united by a shared linguistic heritage, with Mandarin Chinese being their mother tongue.

4.2 Instruments

The questionnaire was structured into two distinct sections. The initial segment solicited information regarding the demographic details of the participants. The subsequent section consisted of two scales: an Effective Teacher Questioning Scale, and a Classroom Engagement Scale. The Effective Teacher Questioning Scale, which was sourced from Ma's [16] research, was composed of four subscales: questioning contents, questioning ways, responding ways, and questioning effects. The Classroom Engagement Scale was similarly segmented into three subscales. The subscales of behavioral and emotional engagement were derived from Skinner et al.'s [31] Engagement Versus Disaffection with Learning Scale, which gauges the extent of students' behavioral and affective engagement in classroom learning activities. The cognitive engagement subscale was adapted by Wang et al. [32] . Prior to the formal survey, these scales were translated into the Chinese language and subjected to a preliminary examination with a group of English major students who were not part of the main study. Ambiguities within the items were addressed through rephrasing, informed by the feedback received from the pilot test participants. For the evaluation of all items, a 5-point Likert scale was employed ranging from 1 (strongly disagree) to 5 (strongly agree).

4.3 Data Analysis

Data analysis was conducted utilizing the statistical software packages SPSS 23.0 and AMOS 28.0. The construct validity of the scales was rigorously assessed through the application of Confirmatory factor analysis (CFA). The reliability of the subscales was evaluated by calculating Cronbach's alpha coefficients. Additionally, descriptive statistics, including mean (M) and standard deviation (SD), were computed to summarize the data. The correlations among the variables were further explored through correlational analysis. Subsequently, Structural Equation Modelling (SEM) was employed to explore the interconnections between effective teacher questioning and the various dimensions of student engagement among the EFL learners examined. In accordance with established criteria from prior research, the model fit is deemed excellent when the Tucker-Lewis Index (TLI) and Comparative Fit Index (CFI) exceed the threshold of 0.95, and acceptable when these indices are above 0.90 [33]. Regarding the Root Mean Square Error of Approximation (RMSEA), values below 0.05 are indicative of a good fit, values up to 0.08 suggest a reasonable fit, and values ranging from 0.08 to 0.10 are indicative of a mediocre fit, as delineated by Browne and Cudeck [34]. Standardized Root-Mean-Square Residual (SRMR) less than 0.08 is seen acceptable [33]. The magnitude of the effects was determined for the respective variables, employing the criteria established by Gignac and Szodorai's [35] guidelines (small =

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0.10 − < 0.20, medium = 0.20 − < 0.30, large ≥ 0.30).

5. Results

5.1 Construct Validity, Reliability, Descriptive Statistics and Correlation Analysis

The Confirmatory Factor Analysis (CFA) results for each scale demonstrated substantial construct validity for both measurement models. The CFA findings pertaining to the scale of effective teacher questioning scale indicated that the four factors had an acceptable fit to the data ($\chi 2$ /df = 4.651, GFI = 0.931, AGFI = 0.912, TLI = 0.953, CFI = 0.960, RMSEA = 0.059, SRMR = 0.029) after removing Item 24 (“The teacher's questions are expressed accurately, concisely, and clearly.”) Item 27 (“The teacher listens attentively and faces the students directly.”) and Item 29 (“The frequency of teacher questioning is appropriate.”) in the subscale of teaching ways, and Item 33 (“The teacher provides timely feedback on the students' answers.”) and Item 34 (“The teacher often finds the students' shining points and gives positive feedback.”) in the subscale of responding ways since their factor loadings are lower than 0.50 [36]. The factor loading of the remaining items ranged from 0.67 to 0.85 and the Cronbach’s α coefficients of the four factors ranged from 0.83 to 0.92, showing that all of the subscales had good internal consistency (as shown in Table 1).

The fit indices of the EFL learners’ classroom engagement scale were also acceptable ($\chi 2$ /df = 4.310, GFI = 0.946, AGFI = 0.928, CFI = 0.970, TLI = 0. 965, RMSEA = 0.056, SRMR = 0.025) after removing one item (When there are activities in the English class, I will actively take part in them.) from the emotional engagement because the factor loading was lower than 0.50. Additionally, the factor loadings for the remaining items spanned from 0.71 to 0.83. Furthermore, the internal consistency of all subscales was affirmed, with Cronbach's α values ranging between 0.87 and 0.93.

The descriptive statistics in Table 1 reveal that the EFL learners scored highest for responding ways (M = 4.18, SD = 0.65). This was succeeded by the mean scores for the questioning contents and questioning ways, both exhibiting a mean of 4.12, albeit with slightly different standard deviations of 0.66 and 0.62, respectively. The lowest mean score was observed in questioning effects (M=3.95, SD=0.74). Further examination of the mean scores associated with the components of classroom engagement, as depicted in the same table, indicates that students scored highest for behavioral engagement (M = 3.91, SD = 0.70). This was closely followed by emotional engagement (M = 3.89, SD = 0.73). Cognitive engagement registered the lowest among the engagement components (M = 3.87, SD = 0.71).

The correlation matrix, as detailed in Table 1, demonstrate that each constituent element of effective teacher questioning had a positive and significant correlation with all three dimensions of classroom engagement, with large effect sizes (0.562< rs < 0.676).

Table 1: Means, standard deviation, reliability and correlation for all variables.

Variable	M	SD	α	1	2	3	4	5	6	7
1. QC	4.12	0.66	0.90	1	.838**	.796**	.683**	.562**	.579*	.564**
2. QW	4.12	0.62	0.91	.838**	1	.865**	.729**	.612**	.601**	.581**
3. RW	4.18	0.65	0.92	.796**	.865**	1	.737**	.575**	.577**	.562**
4. QE	3.95	0.74	0.83	.683**	.729**	.737**	1	.676**	.655**	.664**
5. BE	3.91	0.70	0.89	.562**	.612**	.575**	.676**	1	.802**	.794**
6. EE	3.89	0.73	0.89	.579**	.601**	.577**	.655**	.802**	1	.809**
7. CE	3.87	0.71	0.93	.564**	.581**	.562**	.664**	.794**	.809**	1

Note: M: mean, SD: standard deviation, α: Cronbach’s α, QC: questioning contents, QW: questioning ways, RW: responding ways, QE: questioning effects, BE: behavioral engagement, EE: emotional engagement, CE: cognitive engagement. **p < 0.01

5.2 Structural Equation Model

This study utilized AMOS 28.0 to construct a structural equation model (SEM) to examine the link between effective teacher questioning with and EFL learners' classroom engagement. The model posited effective teacher questioning as the independent variable and classroom engagement as the dependent variable. As shown in Figure 1, the model fit indices were deemed satisfactory ($\chi 2$ /df = 4.427, GFI = 0.959, AGFI = 0.948, CFI = 0.927, TLI = 0. 911, RMSEA = 0.059, SRMR = 0.062).

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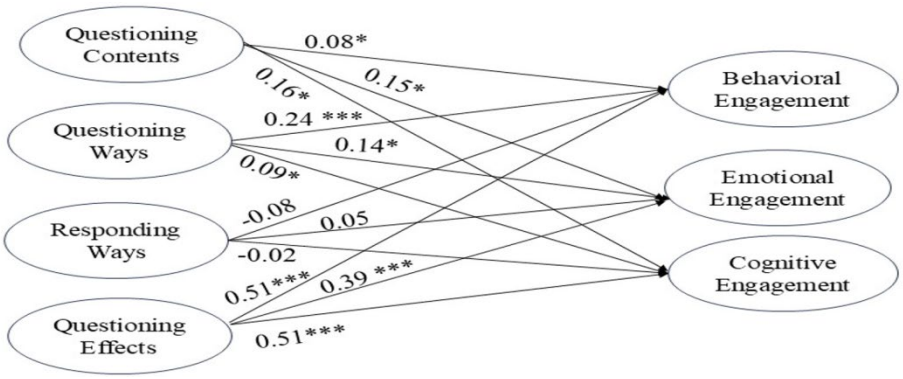

*Figure 1: SEM model results *** $p < 0.001$; * $p < 0.05$*

Table 2 displayed the standardized path coefficients, which revealed that the questioning contents had a positive correlation with the three dimensions of engagement, exerting small to moderate effect sizes. Similarly, questioning ways were found to have a positive impact on the three engagement dimensions, with small to moderate effect sizes. The questioning effects were also significantly and positively linked to the three engagement factors, demonstrating large effect sizes. Conversely, the responding ways did not exhibit a positive relationship with the engagement factors, as indicated by non-significant beta coefficients ($\beta = -0.08$, $p = 0.09$; $\beta = 0.06$, $p = 0.28$; $\beta = -0.03$, $p = 0.59$), all of which failed to surpass the conventional p-value threshold of 0.05.

Table 2: Standardized path coefficients

	path		Estimate	S.E.	P
QC	→	BE	0.082	0.043	0.049
QC	→	EE	0.165	0.048	***
QC	→	CE	0.177	0.045	***
QW	→	BE	0.268	0.049	***
QW	→	EE	0.168	0.054	0.002
QW	→	CE	0.101	0.051	0.047
RW	→	BE	-0.079	0.046	0.088
RW	→	EE	0.055	0.051	0.278
RW	→	CE	-0.026	0.048	0.594
QE	→	BE	0.484	0.033	***
QE	→	EE	0.392	0.036	***
QE	→	CE	0.488	0.034	***

Note: QC: questioning contents, QW: questioning ways, RW: responding ways, QE: questioning effects, BE: behavioral engagement, EE: emotional engagement, CE: cognitive engagement, *** $p < .001$

6. Discussion

This research contributes to the body of literature on effective teacher questioning by elucidating the connections between Chinese EFL learners' perceptions of effective teacher questioning and their levels of classroom engagement within the Chinese educational context. The study employed a sample comprising EFL learners from Chinese universities and demonstrated that these students rated their English instructors' questioning practices quite favorably. The outcomes of the SEM analysis offered valuable insights into the varying impacts of distinct questioning elements on the threefold aspects of engagement.

6.1 Effective Teacher Questioning

This study revealed the status quo of effective EFL teacher questioning in Chinese higher education. The students reported high levels of the responding ways ($M = 4.18$, $SD = 0.65$), questioning contents ($M = 4.12$, $SD = 0.66$) and questioning ways ($M = 4.12$, $SD = 0.62$). This indicates that students generally have a favorable view of the EFL teachers' questioning strategies in the context of Chinese higher education. This could be attributable to the following factors: firstly, the questions posed by teachers could be highly relevant to the course material and the students' needs, making the questioning process more meaningful and valuable. Teachers may have gained an in-depth understanding of the specific needs

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of students and the context in which they use English in their academic activities. This includes the need for academic English skills, such as academic listening with note-taking, academic writing, and reference skills, etc [37]. Secondly, EFL teachers in higher education may have received adequate training in pedagogical methods, including how to ask effective questions that stimulate student interest and understanding. Chinese university administrators attach great importance to the classroom teaching, and teachers may have received training aimed at enhancing the effectiveness of classroom questioning, which involves understanding the types of questions, including those that range from simple to complex cognitive levels. Lastly, the questions might be pitched at an appropriate level of difficulty, challenging students without causing undue frustration. Bloom's taxonomy of cognitive educational objectives categorizes six levels of cognitive functioning, ranging from knowledge to creation. This framework emphasizes different types of cognitive activities, including remembering, understanding, application, analysis, evaluation, and creating. It assists teachers in designing questions that promote students' higher-order thinking skills.

Comparatively, the lowest mean score was observed in questioning effects (M=3.95, SD=0.74). which might indicate that while students find the effects of questioning to be somewhat positive, their satisfaction level is not as high as with the other aspects. This could imply that learners perceive the impact of questioning on their learning outcomes to be less pronounced. It could be attributed to the several factors. First, students might not always see the direct impact of questioning on their learning, especially if the benefits are long-term rather than immediate benefits. In EFL classrooms, teacher questioning plays an important role in students' reading comprehension. Research indicates that optimizing teacher questioning strategies can enhance student engagement and comprehension abilities, but such improvements may necessitate a long-term teaching practice and learning process for realization [38]. Second, there is variability in student expectations. The highest standard deviation (SD = 0.74) indicates that students have varying expectations and experiences with the questioning effects, leading to a broader range of satisfaction levels. There are 1064 participants from 7 Chinese universities in this study, and it is difficult to ensure all the participants are satisfied with the questioning effects. Third, diverse learning styles do exist in EFL learners. Not all students may benefit equally from a questioning-based approach, as individual learning styles and preferences vary. Each EFL learner has their own unique language learning background, interests, and goals. Teachers should take these individual differences into account when designing teaching activities and attempt to use a variety of teaching strategies to meet the needs of different students [39] .

6.2 The Relationship between Effective Teacher Questioning and Classroom Engagement

The SEM findings indicated a significant positive correlation between the three dimensions of effective teacher questioning and the three facets of classroom engagement among EFL learners (β = 0.73). This corroborates prior research that suggests educators who pose effective questions elicit more intricate student responses and foster a higher degree of student engagement compared to those who pose ineffective questions. This pattern has been observed across both EFL [40] and ESL (English as a Second Language) [41] educational settings.

The SEM results revealed that among the EFL learners, questioning contents, questioning ways, and questioning effects had a positive correlation with all three dimensions of engagement, and the responding ways was not significantly associated with all the three engagement factors. According to Ma [16], effective teacher questioning contents refers to questions that reflect educational objectives, include a variety of question types, and are challenging, thought-provoking, aligned with the cognitive development level of students, and relevant to students' real-life experiences. The significant positive correlation between questioning contents and engagement suggested that the questions asked by teachers played a crucial role in stimulating and maintaining the interest, participation, and overall engagement of EFL students in educational activities. When teachers ask questions that are well-crafted, relevant, and thought-provoking, they are likely to elicit more active and deeper engagement from their students. The results confirmed the findings of previous studies in which questions which were closely related to students' life and invited recounts of personal experiences were more interactive and more engaged students [4] and challenging and higher-order questions can stimulate cognitive engagement by encouraging students to analyze, synthesize, and evaluate information. As a result, learners who perceived their English teachers' questioning contents effective are inclined to exert greater effort, show increased interest and curiosity, and engage in more strategic learning behaviors aimed at enhancing their language proficiency.

This study also revealed positive relationships between the questioning ways and all three engagement dimensions. According to Ma [16], effective questioning ways is included in the following

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aspects: teachers use vocabulary and expressions that students are familiar with and understand; teachers create question contexts for students; teachers expand questions in a diversified way; teachers give students adequate waiting time for answers; teachers ask questions before calling on students, address all students, listen attentively, face students directly, and provide timely feedback, and the frequency of teacher questioning is appropriate. This present finding was consistent with the finding of Tsui's [42] study, in which he found that teachers' use of familiar vocabulary and expressions can facilitate cognitive engagement by making content more accessible and comprehensible. When teachers use vocabulary and expressions that students are already familiar with, it reduces the cognitive load associated with language processing. The present finding also supported Di Teodoro et al.'s [26] research which showed that the diversity of teacher questions could influence the frequency and quality of student responses, indicating behavioral engagement. This is because a diverse set of questions can scaffold learning by gradually increasing the complexity of the inquiries, allowing students to build upon their understanding in a step-by-step manner. Moreover, the present study also agreed with Lim et al's [43] study indicating that students who experienced teachers employing exhibiting patience for students' replies perceived their teachers as supportive and attentive listeners, contributing to students' emotional engagement. When teachers demonstrate patience, it can create a safe and non-threatening learning environment where students feel comfortable expressing their thoughts without fear of immediate judgment or correction.

The research further uncovered significant positive correlations between the questioning effects and each of the three dimensions of engagement, characterized by the largest effect sizes. According to Ma [16], effective teacher questioning effects include: students actively answering questions, students providing basically correct or somewhat in-depth responses, students daring to ask questions and express opinions, and students gaining a more profound understanding and mastery of knowledge. This study supported previous study which indicated effective teacher questioning could lead to increased student behavioral engagement, including active participation, question-asking, and opinion expression [44]. Through effective questioning, teachers help clarify concepts and ideas, which can lead to better understanding and, consequently, a higher likelihood of students demonstrating their understanding through behavioral actions. This study was also in line with the prior research suggesting that teacher questions that promote problem-solving could increase students' interest and motivation, key components of emotional engagement [45]. This is because when students master the knowledge with the help of teachers' effective questioning, students would have positive emotional experiences, such as pride, confidence, satisfaction, etc. Besides, this research agreed with the prior research suggesting teacher questions could enhance comprehension and cognitive engagement during reading activities [46]. Teachers' questions can support cognitive engagement by helping students connect new information to existing knowledge and challenging students to think critically and apply their knowledge. Our study added empirical evidence to support that effective teacher questioning had a strong link with EFL learners' classroom engagement, highlighting the need for more effective teacher questions.

This study also indicated that the responding ways were insufficient to explain the learning engagement of EFL learners. Ma [16] suggested that teachers' effective responding ways include teachers' targeted evaluation, diversified feedback methods and skills, and they also mean that teachers are good at using non-verbal strategies and encouraging students to question. Teachers' responding to students in the classroom is seen as a part of teacher-student interaction. Teachers provide feedback with students, which is a teacher support. The present finding was consistent with Liu et al's [47] research, which indicated that teachers' academic support and emotional support affect the learning engagement of EFL learners through the mediating roles of self-efficacy and achievement goal orientation. This suggests that although teacher support is an important factor, it is not the only factor that independently affects learning engagement. Research on feedback emphasized the importance of feedback for learning, but also pointed out the inconsistencies between feedback practice and theory. Effective feedback should focus on learning tasks, be targeted, appropriately challenging, and require the active participation of learners. This indicates that teachers' responding ways need to be combined with individual factors of learners, such as self-efficacy and the learning environment like peer feedback to better promote the engagement of learners.

It is imperative to acknowledge several limitations inherent in this study that may inform future investigative endeavors. Firstly, the cross-sectional nature of this research precludes the determination of causality between teacher questioning and student engagement. Subsequent studies should employ a longitudinal framework to discern the causal pathways. Secondly, the reliance on self-reporting instruments in the current investigation could potentially have resulted in overstated associations between teacher questioning and engagement. Future studies would benefit from incorporating mixed-methods to enrich understanding and provide additional perspectives on these relationships. Thirdly, the variable-centered methodology utilized in this study generates results reflective of a generalized participant, which

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may not encapsulate the individual experiences of the study's actual participants. Subsequent research might consider a person-centered methodology, such as latent profile analysis, to delineate the heterogeneity among subgroups within a sample. Lastly, as an exploratory study predicated on survey questionnaires, the singular data source may offer limited vantage points for a thorough and profound comprehension of the subject matter. Future research should aim to integrate diverse data sources to enhance the validity of the findings through triangulation.

7. Conclusions and Implication for Practice

This research explored the status of effective teacher questioning in Chinese higher education and the relationship between teacher questioning perceived by EFL learners and their classroom engagement. It was found that EFL learners had a positive attitude towards their English teachers' questioning. The analysis also revealed that the questioning contents, questioning ways and questioning effects had positive correlation with students' classroom engagement, while responding ways could not account for the engagement. This research contributes to the body of knowledge concerning effective teacher questioning by elucidating the linkage between questioning and the level of student engagement among English language learners in China. The study's outcomes yield meaningful educational implications, pertinent to the enhancement and comprehension of English language learning and teaching within the context of higher education.

First, the presence of a strong positive relationship between the questioning contents and student engagement indicates that teachers need to pose questions that are relevant and connected to the students' prior knowledge, interests, and the learning objectives to capture their attention and motivation. It is advisable for teachers to utilize a mix of question types (e.g., factual, conceptual, analytical, and evaluative) to cater to different learning styles and to promote various cognitive processes. Meanwhile, in the contemporary era marked by swift technological advancements, teachers can amplify the effectiveness of their questioning techniques and foster a greater appreciation for learning English among students. This can be achieved by promoting organic exposure to and utilization of the language through an array of digital tools, including educational applications and social media platforms as suggested by Lee & Lee [48]. These approaches can cultivate students' proactivity and capacity for autonomous education, meanwhile, they can help teachers enhance their efficacy of questions.

Second, the significant relationship between the questioning ways and engagement revealed in the present study indicates the importance of promoting questioning ways among students. Different approaches are needed to help enhance teacher questioning, thus stimulating students to engage more actively and enthusiastically in classroom learning. For example, teachers could use utilize higher-order thinking questions, such as those that require analysis, synthesis, and evaluation, to foster students' in-depth contemplation. Teachers could use questioning to motivate students to actively participate in classroom activities. This might involve raising hands to speak, engaging in group discussions, or participating in interactive learning activities, thereby increasing students' level of involvement and motivation to learn. The way teachers ask questions should establish a positive emotional connection, making students feel that their opinions are valued and respected. This helps build students' self-confidence and an emotional connection to the learning material.

Third, the substantial connection between the questioning effects and the level of student engagement, as demonstrated in this research, underscores the significance of enhancing the questioning effects among learners. A variety of methods should be employed to improve the quality of teachers' questioning, thereby encouraging students to participate more vigorously and enthusiastically in the learning process within the classroom. For example, teachers can design questions that stimulate students' enthusiasm, encouraging them to actively respond to questions and teachers should encourage students to ask questions and express their opinions, which helps develop their critical thinking and independent thought. Furthermore, teachers should provide a safe learning environment in the classroom for students, ensuring that students feel safe to ask questions and express their opinions in the classroom, which helps build their confidence. Last but not least, teachers can help students think about their learning process and strategies through questioning, improving their metacognitive awareness.

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