ISSN 2616-7433 Vol. 6, Issue 10: 102-108, DOI: 10.25236/FSST.2024.061015

Research on the Effectiveness of Private College English Teachers' Questioning in a Web-based Learning and Teaching Environment

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Abstract: *Questioning is a fundamental aspect of pedagogy, with the quality and relevance of questions posed by educators playing a crucial role in the efficacy of instruction. The incorporation of internet-based technologies has the potential to augment the impact of questioning strategies employed by college instructors, thereby boosting student motivation, involvement, and academic achievement. This paper delves into the strategies English educators in Chinese higher education utilize to formulate and ask effective questions in the web-based learning and teaching environment. This paper is supported by the social constructivist learning theory, which posits that learning is inherently social and involves the construction of knowledge through interactive processes. The study introduces a model for web-based questioning aimed at enhancing English instruction in private Chinese colleges, including essential facets of online pedagogy such as preparation, engagement, assessment, feedback, reflection, and adjustment. The paper concludes with an emphasis on the significance of employing effective questioning techniques for English teachers in Chinese colleges according to the proposed model as a teaching method.*

Keywords: *English teaching; questioning strategies; the social constructivist learning theory; Web-based learning and teaching environment*

1. Introduction

The integration of technology in education has sparked a revolution in teaching methodologies, particularly in the realm of English language instruction. Numerous studies have attested to the benefits of technology-enhanced teaching on student learning [1][2]. For example, Ali et al [1] found that the incorporation of technological tools positively affected the engagement and academic success of students. In particular, the integration of technology has a significant influence on enhancing student motivation, attitudes towards learning, and their academic performance. Furthermore, the employment of technological resources is instrumental in fostering the development of critical thinking and problem-solving competencies. Technology-assisted educational strategies have been found to be efficacious across a spectrum of learners, regardless of their age or proficiency level. However, many educators have yet to fully harness the potential of the internet to transform their pedagogical approaches. In particular, English teachers in Chinese colleges often overemphasize traditional methods of instruction, focusing on lower-order questioning that targets memory, comprehension, and application, which may have potential negative effects on student development [3]. This approach may neglect the need for higher-order questioning that stimulates analysis, synthesis, and evaluation, which are crucial for developing students' critical thinking skills [4]. In practice, the prevalent methods often fail to recognize the importance of leveraging internet resources to facilitate more interactive and engaging forms of higher-order questioning. This oversight can lead to a lack of depth in classroom discourse and hinder the cultivation of students' abilities to think critically and independently [5].

Addressing these concerns, scholars have begun to explore the potential of technology to enhance classroom interactions. For instance, Lan and Lin[6] developed a web-based learning system, called the Question-Posing Indicators Service (QPIS) System that is used to measure individual students' question-posing ability. Their approach, which is predominantly centered on student-generated questions, demonstrates the potential of the internet to facilitate a more dynamic and interactive learning environment. However, there is a notable absence of research that addresses the role of teachers in posing questions within the same digital landscape, particularly within the context of Chinese private colleges. Recognizing this gap, the present study aims to explore innovative designs for English teachers' classroom questioning models that facilitate higher-order thinking.

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This study is grounded in the assumption that private college English teachers can utilize internet resources to conduct effective classroom questioning, shifting from a focus on lower-order to higher-order questions. By doing so, it is anticipated that students' abilities to engage in analytical, synthetic, and evaluative thinking will be significantly enhanced.

2. Social Constructivist Learning Theory

The social constructivist learning theory posits that educational development is not an isolated phenomenon confined to the individual, but rather a dynamic, interactive process that unfolds within a social context. This theory refutes the notion of learning as a mere passive acquisition of behaviors shaped by external stimuli [7]. It emphasizes that meaningful learning transpires when individuals actively participate in social interactions, with questioning emerging as a critical tool for engaging students in these collaborative endeavors. Through the strategic employment of well-formulated questions, students are enabled to collaborate in the exploration and resolution of complex issues and challenges.

Social constructivism, as articulated by Vygotsky [8], underscores the pivotal role of “significant others” in the construction of knowledge. In the context of higher education, the teacher assumes the role of this “significant other”, acting as a mediator of learning environments designed to foster student engagement. This mediation is facilitated through questioning, which guides students in their pursuit of active learning within student-centered educational activities. Questions are also instrumental in aiding students to construct their own understanding by integrating their prior knowledge and experiences. An additional pedagogical strategy within social constructivism is scaffolding, which fosters dialogue between students and educators. Scaffolding employs questions to support students' comprehension of taught concepts, requiring them to expand upon and substantiate their responses.

Anchored instruction, aligned with social constructivism, advocates for learning environments that stimulate thoughtful engagement, thereby equipping students with the critical thinking skills and dispositions necessary for effective problem-solving and decision-making. Effective questioning is a key facilitator of such engagement, with educators' use of higher-order questions promoting critical thinking among students. This form of thinking is often directed towards addressing real-world social issues, thereby shifting the focus of learning from mere knowledge acquisition to the application of knowledge in solving practical problems.

3. Literature Review

The act of questioning is widely acknowledged as a pivotal instructional strategy, as it serves as the primary means by which educators stimulate engagement, cognitive processing, and educational acquisition within the classroom setting [9]. Scholars commonly conceptualize a question as a linguistic construct that possesses an inquisitive structure or serves an investigative purpose. Within the educational context, teacher-generated questions are defined as pedagogical cues or prompts that communicate to learners the specific content areas to be explored and the directives for their actions, including both the objectives to be achieved and the methodologies to be employed in their pursuit [10].

Effective questioning strategies can significantly improve student classroom engagement and motivation to learn. Effective questioning strategies, like the Question as Thinking framework, can help develop active instructional patterns that promote students' negotiation of meaning and improve comprehension of expository texts[11]. Open-ended questions stimulate more thought and discussion among students than closed-ended questions. Moreover, the difficulty, relevance, and timing of questions are also important factors affecting student engagement. By optimizing these characteristics of questions, teachers can more effectively promote student participation and learning.

The questioning strategies of English teachers in private colleges are crucial for improving teaching effectiveness. Teachers' personal characteristics, teaching experience, and classroom management skills collectively affect the effectiveness of questioning. Research indicates that a teacher's passion for teaching, language knowledge, and proficiency in educational technology significantly influence the choice and implementation of questioning strategies [6]. Additionally, a teacher's classroom management skills, including time management, motivation of students, and classroom atmosphere creation, are also key factors affecting the effectiveness of questioning.

In the web-based teaching environment, Internet technology has brought new patterns of classroom interaction to English teaching. It can change traditional classroom interaction and enhance student

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participation. The use of online platforms and multimedia tools not only enriches teaching resources but also provides students with more opportunities to express and feedback [12]. Through online discussion areas, real-time Q&A, and peer review functions, students can participate more actively in classroom activities, which in turn improves the effectiveness of teachers' questioning. The use of platforms like MosoInk Cloud Class has been shown to enhance student engagement by facilitating online and offline blended teaching models. This approach breaks away from the traditional teacher-centered model, empowering students to take a more active role in their learning process [13].

Technological tools play an increasingly important role in enhancing the effectiveness of teachers' questioning. Online Q&A systems, real-time feedback tools, and others help teachers improve the effectiveness of their questioning. These tools not only help teachers collect student feedback in real-time but also allow them to adjust teaching strategies based on students' learning data [6]. Data-driven teaching methods enable teachers to more accurately understand students' learning needs, thereby designing more effective questioning strategies.

In the realm of question-posing learning activities, a multitude of scholars have crafted diverse support systems aimed at enhancing the efficacy of educational and learning processes within the web-based environment. Such systems include the QSIA [14], QPPA [15], PeerWise[16], and Concerto II [17]. These researchers have also delved into the practical challenges encountered when incorporating question-posing activities into teaching methodologies. These challenges consist of determining the primary entity responsible for posing questions, whether it be instructors or learners, the participants involved in the assessment process, and the disparities in scoring among different evaluators, such as self-assessment, peer assessment, and teacher assessment. Additionally, they have explored the various formats permitted for posing questions, such as text, figures, and tables, as well as the methods for facilitating communication support, like group reviews, asynchronous discussion forums, or BBS. [18][19].

Broadly speaking, most of the above developed systems highlight that question-posing activities are inherently social and collaborative in nature, fostering a learning environment where both educators and students engage in the creation and dissemination of educational materials and experiences. Such an approach not only motivates participants to contribute to the collective learning process of their peers but also instills a sense of appreciation for the contributions made by others within the academic community. Nevertheless, these systems are largely designed based on Western educational contexts and learner characteristics, which may not be entirely suitable for the interaction patterns between teachers and students in Chinese universities. The educational environment, cultural background, and cognitive habits of learners in China differ significantly from those in Western countries, potentially leading to a lack of adaptation when applying existing models in a localized context. Meanwhile, there is a relative scarcity of research by Chinese scholars on questioning models in web-based environments, particularly in terms of model construction that integrates the actual situation of Chinese universities. While some studies have focused on teacher-student dialogue in traditional classrooms and conducted various types of coding and analysis [20], these studies often fall short in exploring the interaction patterns of questioning in web-based environments. Additionally, the questioning interaction patterns in a web-based environment place higher demands on teachers' information technology capabilities. Teachers need to master how to ask effective questions in a virtual environment, how to use technological tools to collect and analyze student feedback, and how to adjust teaching strategies according to the characteristics of online interaction. In summary, there is a significant research gap in the development of questioning models for college English teachers in a web-based learning environment that are tailored to the context of Chinese universities. It is necessary to develop interaction patterns suitable for Chinese university teachers and students by integrating the local educational and cultural background with the characteristics of online teaching to enhance the effectiveness of English teaching in a web-based environment.

4. The Present Study

4.1 Purpose of the Study

The aims of the present study are to develop and implement a web-based learning and teaching model, called the Web-based Teachers' Effective Questioning (WTEQ) Model, designed to assist teachers in posing effective questions, and enhance the quality of teaching and learning activities among the instructor, student and peers.

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4.2 Overview of the Proposed Model

The proposed model for enhancing the effectiveness of questioning strategies by English teachers in online environments is designed to integrate pedagogical techniques with technological tools. This system, referred to as the Web-based Teachers' Effective Questioning (WTEQ) Model, aims to facilitate active learning, critical thinking, and knowledge construction among students. The system is anchored on a network learning platform that supports various modules essential for a dynamic and interactive learning experience.

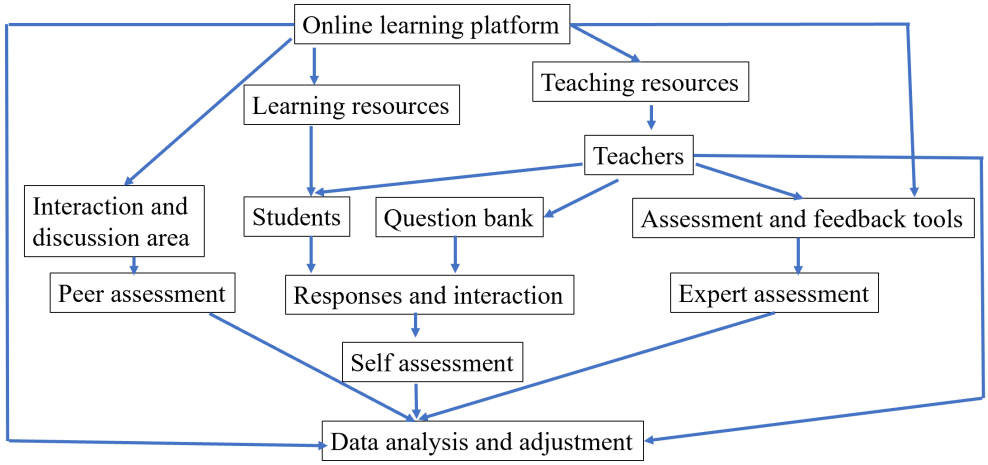

Figure 1: Web-based Teachers' Effective Questioning Model

The WTEQ model presented in Figure 1 encapsulates the dynamic interplay between various components within a web-based learning and teaching environment, providing a comprehensive framework for understanding the dynamics of teacher questioning. At the heart of this model is the online learning platform module, which serves as the foundational infrastructure that supports all educational interactions and resource sharing.

Teaching resources module and learning resources module are integral components that are made accessible through the platform, enabling teachers to deliver content and students to engage with material that fosters their learning. These resources are designed to be interactive and adaptable to various learning styles and preferences.

Central to the model are the teachers and students, whose interactions are facilitated by the platform. Teachers play a dual role as content providers and assessors, utilizing the question bank module to pose questions that challenge students and stimulate critical thinking. The question bank module is a repository of diverse questioning strategies developed by the teacher that are aligned with learning objectives and students' cognitive levels and are instrumental in guiding the learning process.

Teachers utilize the platform to engage with students through an interaction and discussion area module, where the act of questioning is a pivotal activity. This area is designed to foster a collaborative learning environment where students can interact with both the content and their peers, leading to a more comprehensive understanding of the material.

Assessment is a key function of the model, with assessment and feedback tools module providing teachers with the means to evaluate student performance and provide constructive feedback. These tools enable both formative and summative assessments, allowing teachers to gauge student progress and adjust their teaching strategies accordingly.

Peer assessment and self-assessment modules are integral to the model, promoting metacognitive skills and enabling students to reflect on their learning and that of their peers. This process enhances student autonomy and deepens their understanding of the subject matter, which are critical for higher-order learning.

The model also includes an expert assessment component, where teachers, as experts in their field, provide evaluations that can guide students in their learning journey and help them achieve the desired learning outcomes.

The responses and interaction component captures the dialogue between students and teachers, as

ISSN 2616-7433 Vol. 6, Issue 10: 102-108, DOI: 10.25236/FSST.2024.061015

well as among students themselves. This exchange of ideas is vital for the co-construction of knowledge and for students to internalize the learning material through discourse.

The model concludes with a data Analysis and adjustment loop, emphasizing the importance of continuous improvement in teaching practices. By analyzing the data collected from assessments and student interactions, teachers can make informed decisions to refine their questioning techniques and overall instructional approach, ensuring that the learning experience is both effective and responsive to student needs.

This model underscores the significance of teacher questioning in a web-based learning environment and presents a systematic framework for enhancing the quality of education in private colleges. It highlights the interconnected nature of teaching, learning, and assessment, and how these elements can be optimized through the strategic use of technology.

4.3 Implementation Process of the Proposed Model

The effectiveness of questioning in a web-based learning and teaching environment is contingent upon a structured implementation process that fosters student engagement and facilitates meaningful learning outcomes. This process is delineated into five distinct yet interrelated stages: preparation, engagement, assessment, feedback, reflection and adjustment.

4.3.1 Preparation

The initial stage involves meticulous preparation by the educators. Teachers are tasked with the responsibility of curating and uploading course materials, teaching resources and learning resources that are aligned with the predetermined learning objectives. Concurrently, they must design questions that are not only relevant but also serve to stimulate critical thinking and application of knowledge. This preparatory phase is pivotal as it lays the foundation for the subsequent interactive components of the model.

4.3.2 Engagement

Following the preparation, students are encouraged to actively engage with the course materials and learning resources. This engagement is facilitated through discussions that are initiated by the teacher's questions. These discussions are designed to be interactive, promoting a collaborative learning environment where students can exchange ideas, challenge perspectives, and deepen their understanding of the subject matter.

4.3.3 Assessment

The third stage integrates a formative assessment process, which is crucial for gauging student comprehension and the effectiveness of the questioning strategies. This assessment includes both self-assessment, allowing students to reflect on their own learning, peer assessment, which fosters a community of learners who support each other's growth, and teacher assessment, which guides students' learning. The assessment tools are selected to provide constructive feedback that can be used to inform future learning activities.

4.3.4 Feedback

Feedback is a critical component of the learning process, and in this model, it is provided by the teachers based on the assessment results and data analysis. This feedback is intended to be constructive, highlighting areas of strength as well as opportunities for improvement. It serves to reinforce learning and guide students towards achieving the learning objectives more effectively.

4.3.5 Reflection and Adjustment

The final stage of the implementation process is a reflective one, where teachers evaluate the effectiveness of their questioning strategies. This reflection is based on the feedback received from students, the assessment outcomes, and the overall engagement observed during the course. Based on this reflection, teachers make necessary adjustments to their questioning techniques to enhance student learning and engagement in subsequent iterations of the course.

The cyclical nature of this implementation process ensures that the model is dynamic and adaptable, capable of evolving in response to the changing needs of students and the educational environment. It is through this continuous refinement that the model aims to maximize the effectiveness of teacher questioning in a web-based learning and teaching context.

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5. Conclusions and Implications for Pedagogical Practice

In conclusion, the present research proposed a web-based questioning model for English teachers in private Chinese colleges which emphasized a comprehensive approach to online teaching that integrates preparation, engagement, assessment, feedback, reflection, and adjustment. It is designed to leverage the interactive potential of online learning platforms to enhance the effectiveness of questioning strategies in a digital environment and improve student engagement, critical thinking, and overall learning outcomes.

The implications for pedagogical practice are significant. This model encourages English teachers to adopt a more active role in facilitating online discussions and to use technology as a tool for enhancing student engagement and learning. It also highlights the importance of formative assessment and feedback in the online learning process, as well as the need for teachers to be adaptable and responsive to student needs.

For future research, this model provides a framework for investigating the impact of different questioning strategies on student learning outcomes in web-based environments. It also opens avenues for exploring how teachers can be supported in developing the skills necessary to effectively implement such models in their teaching practice.

Acknowledgement

This work was supported by the Guangdong Province Teaching Quality and Teaching Reform Construction Program (Grant no. HS2021ZLGC49).

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