



Question Design in Rural Middle School English Reading Classroom for Critical Thinking Development

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Abstract. This study employed classroom observations, surveys, and interviews to examine the influence of question formulation on the advancement of critical thinking within the context of English reading instruction in rural Chinese middle schools. The findings indicate that while the development of critical thinking among rural middle school English learners is extensive, it is marked by disparities, particularly in the uneven distribution of critical thinking skills and dispositions, as well as a general lack of comprehensive critical thinking education. Moreover, the constrained comprehension of critical thinking by rural educators, the proficiency in English of rural middle school students, institutional assessment practices, and the inherent intricacies of critical thinking collectively impede the cultivation of critical thinking in English language classrooms. Nevertheless, the study suggests that the strategic and flexible application of a triad of question types can facilitate rural students' engagement across the cognitive spectrum, thereby fostering the growth of critical thinking abilities.

Keywords: Rural Middle School English, Critical Thinking, Question Design, Reading Class.

1 Introduction

The cultivation of critical thinking is a widely recognized priority across all levels of education and within the curricula of various subjects, with English as a Foreign Language (EFL) instruction being no exception. The pedagogy of English is inherently an interactive process that involves a dynamic exchange between educators and learners, collaboratively striving for the linguistic development of the students. A pivotal element in facilitating this interactive learning is the strategic use of well-crafted questions. Given their instrumental role, questions are identified as the linchpin of impactful critical thinking instruction. Against this backdrop, an increasing body of scholarly work has been dedicated to examining question design as it pertains to the enhancement of critical thinking in EFL reading curricula. Empirical studies have established a significant link between the nature of questions posed and the critical thinking dispositions of students [1]. A study focusing on the cultivation of critical thinking competencies within reading classes substantiated the notion that questions deliberately aimed at honing these skills positively influence students' reading proficiency [2]. Other inquiries

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Y. Li et al. (eds.), *Proceedings of the 2024 3rd International Conference on Science Education and Art Appreciation (SEAA 2024)*, Advances in Social Science, Education and Humanities Research 866,

https://doi.org/10.2991/978-2-38476-291-0_30

have delved into the mechanisms through which questions can be leveraged to foster critical thinking. It has been suggested that educators can employ a spectrum of question types to catalyze varying degrees of critical thinking, with more complex questions eliciting more sophisticated responses [3]. Furthermore, nurturing students' propensity for inquiry and encouraging them to pose questions with audacity has been shown to be conducive to the development of critical thinking in the context of EFL reading instruction [4]. The strategic deployment of display, reference, evaluation, and application question chains in reading classes has been posited as an efficacious pedagogical strategy for nurturing students' critical thinking capabilities [5].

Despite the growing systematic nature of research in this domain, there remains a scarcity of studies that concurrently address both critical thinking skills and dispositions, as many scholars, both domestically and internationally, tend to concentrate on one aspect in isolation. Furthermore, the critical thinking of students in rural areas is seldom the subject of scholarly discourse. A pervasive deficiency in critical thinking persists among students engaged in middle school EFL reading education [6]. In light of these observations, this study was initiated with the aim of scrutinizing the design of questions in rural middle school English reading classes as a means to foster the development of critical thinking.

2 Research Methodolog

2.1 Research Questions

In light of the prevailing conditions at two rural middle schools, this study endeavors to identify and elucidate the impediments encountered within the realm of pedagogical practice. The primary objectives of this research are to address the following inquiries: Firstly, what constitutes the prevailing state of critical thinking proficiency among rural middle school students? Secondly, what challenges do educators encounter when crafting questions intended to foster the development of critical thinking within the context of English reading instruction in rural middle schools? Thirdly, what methodologies should be employed in the design of questions aimed at cultivating students' critical thinking abilities within the same educational setting?

2.2 Research Participants

The research was executed during the principal investigator's apprenticeship period, spanning a duration of approximately two weeks. The study population comprised educators and learners from the Simen Experimental School, affiliated with Zhejiang Normal University in Ningbo, and the Yinong Town Junior Middle School situated in Hangzhou. A cohort consisting of 19 English educators and 387 students from the aforementioned rural schools in Ningbo and Hangzhou was meticulously selected to participate in the survey component of the study. The group of 19 teachers represented the general teaching staff. Furthermore, to enrich the study's findings and attain a more holistic comprehension of the research queries, a random selection of five English teachers from the pool of survey participants was conducted for in-depth interviews.

2.3 Research Instruments

Considering the inherent ambiguity and complexity associated with critical thinking dispositions, which pose challenges for quantitative measurement, the classroom observations were confined to the assessment of critical thinking skills. Specifically, the focus was on three types of questions: indicative questions aimed at honing the skills of interpretation, analysis, and self-regulation; referential questions directed towards the development of explanation and inference; and evaluative questions centered on the ability to evaluate.

To gather insights from educators, the researcher developed the “Questionnaire for Question Design for Critical Thinking Development (Teacher Version)”, which is divided into two sections. The first section pertains to the current state of critical thinking cultivation through question design in rural middle school English reading classes, while the second section delves into teachers’ perceptions and challenges regarding the design of questions aimed at fostering critical thinking in the same educational context.

In an effort to capture the students’ perspective on the state of critical thinking cultivation, the researcher also compiled the “Questionnaire for Question Design for Critical Thinking Development (Student Version)”, comprising 23 items. Similarly structured around a Likert scale, the items were organized into five levels of indicators encompassing interpretation, analysis, inference, evaluation, explanation, and self-regulation. With the assistance of teachers, the questionnaires were distributed in hardcopy to five classes across the two rural secondary schools, resulting in 387 responses.

To further enrich the study, the researcher formulated seven open-ended interview questions. The interviews were structured to explore three dimensions: the teachers’ understanding of critical thinking (CT) and its cultivation, the current state of CT cultivation and potential strategies for its enhancement, and the specific support needs of teachers in fostering CT development.

3 Results

3.1 Results of Classroom Observation

To ascertain the actual status of critical thinking skills cultivation within the classroom, the questions posed were systematically coded and categorized. A total of 108 questions were identified as effective across the two lessons observed. The majority of these questions, constituting 55%, were dedicated to fostering the skill of Interpretation. This was succeeded by questions aimed at Analysis and Inference, with 17 and 12 questions respectively. Questions targeting the development of Evaluation, Explanation, and Self-regulation skills were nearly equivalent in number and collectively represented a minor proportion of the total. This distribution suggests a pronounced reliance by rural educators on questions that pertain to Interpretation, with a concurrent neglect of the cultivation of Evaluation, Explanation, and Self-regulation skills. Furthermore, the data presented in Table 1 reveal that indicative questions predominated, comprising 75.0% of the classroom discourse, thereby overwhelming the other types of questions. Referential questions constituted 17.6% of the classroom questions, while evaluative questions

made up a mere 7.4%. This stark disparity underscores a clear bias in reading question design towards lower-order critical thinking skills.

Table 1. The Frequencies and Percentages of Reading Questions for Critical Thinking Skills Cultivation

Question Types	Critical Thinking Skills	Frequency	Percentage
Indicative questions	Interpretation	59	54.6%
	Analysis	17	15.7%
	Self-Regulation	8	7.4%
Referential questions	Inference	12	11.1%
	Explanation	7	6.5%
Evaluative questions	Evaluation	5	4.6%
Sum		108	100.0%

3.2 Results of Questionnaire (Teacher Version)

To evaluate the endeavors of rural English educators in cultivating critical thinking skills and dispositions, an analysis of the mean values and standard deviations from the initial segment of the data was employed. Table 2 delineates the prioritization accorded to various critical thinking skills and dispositions by the teachers when formulating questions for instruction.

Table 2. Questionnaire Data of Critical Thinking Cultivation

	Critical Thinking	Mean	Standard Deviation
Critical Thinking Skills	Interpretation	3.51	0.966
	Analysis	3.53	1.002
	Inference	2.89	0.880
	Evaluation	3.56	0.802
	Explanation	3.37	0.816
	Self-Regulation	3.05	0.811
	Curiosity	3.89	0.658
Critical Thinking Dispositions	Open-mindedness	4.00	0.745
	Confidence	3.53	0.697
	Integrity	3.95	0.524
	Perseverance	3.95	0.911

The findings presented in Table 2 reveal that within the spectrum of critical thinking skills, Evaluation and Analysis score the highest mean values, whereas Inference and Self-Regulation register comparatively lower means. This suggests a pronounced focus among question designers on fostering Evaluation and Analysis skills, especially compared with Inference and Self-Regulation. This aligns with classroom observation data, indicating a propensity among rural English teachers to concentrate on developing surface-level, text-based critical thinking abilities, such as the summarization of principal

textual content. Conversely, there is a noticeable omission in nurturing skills that pertain to individual reasoning, including the assessment of the credibility of textual information.

Table 2 also indicates that among the critical thinking dispositions, Open-mindedness attains the highest mean score of 4.00, whereas Confidence records the lowest mean at 3.53. The mean scores for Curiosity, Integrity, and Perseverance are closely matched, suggesting a tendency among teachers to prioritize the cultivation of Open-mindedness while potentially overlooking the development of Confidence. This may lead to a predisposition among rural middle school English learners to uncritically accept authoritative sources.

In an effort to probe the perceptions and challenges rural English teachers face regarding critical thinking and its cultivation, the frequencies and percentages from the second segment of the data were analyzed. Table 3 illuminates three key insights. Firstly, the majority of teachers demonstrate an awareness of critical thinking, with only a small fraction, approximately 5%, lacking such understanding. Most participants exhibit basic comprehension of the two dimensions of critical thinking. Secondly, the mean perception regarding the cultivation of critical thinking is 4.13, signifying a strong consensus among participants on its importance, with no negative perceptions recorded. However, a prevailing sentiment suggests that it is challenging to cultivate critical thinking within the context of rural English reading classes. Lastly, all participants express a preference for enhancing critical thinking through deliberate question design in reading classes. Despite a general agreement, ranging from 40% to 60%, that participants are cognizant of question design strategies aimed at critical thinking, there is a significant lack of confidence in the precise implementation of these strategies. In summary, while most rural teachers possess an awareness of critical thinking, this understanding is not comprehensive, resulting in limited knowledge regarding the effective design of reading questions to foster critical thinking.

Table 3. Questionnaire Data for Teachers' Perception of CT

Teacher's Perceptions	Mean	Standard Deviation
Critical Thinking's Concept	3.55	0.724
Critical Thinking Cultivation	4.13	0.741
Relation between Critical Thinking Cultivation and Question Design	3.68	0.783

Table 4 delineates the challenges encountered by rural English teachers in the realm of question design aimed at fostering critical thinking. Notably, the mean scores attributed to student-related factors and institutional constraints are significantly higher than those of other categories, whereas the mean scores for course content and teacher-related issues are the lowest. This suggests that the paramount obstacles to effective question design are the assessment policies of the school and the English language proficiency of the students.

Table 4. Six Factors of the Difficulty in Question Design for the Development of Critical Thinking

Difficulty	Mean	Standard Deviation
Critical Thinking Itself	3.55	0.891
Society	3.50	0.762
School	3.58	1.106
Course	2.58	0.919
Teacher	2.74	1.083
Student	3.61	1.001

3.3 Results of Questionnaire (Student Version)

To assess the current proficiency levels of rural students in critical thinking skills, the survey data was analyzed using mean values and standard deviations. Table 5 illustrates that the Self-Regulation skill has a high mean score of 3.46, closely followed by Interpretation with a mean score of 3.31. In contrast, the mean scores for Evaluation (3.03), Inference (3.00), and Explanation (2.95) are comparatively lower. This indicates that within the context of English reading classes, there is a greater emphasis on, and hence better performance in, the development of Self-Regulation and Interpretation skills. Conversely, there appears to be a relative neglect in the cultivation of Explanation, Inference, and Evaluation skills, as reflected by their lower mean scores.

Table 5. Questionnaire Data for Students of Critical Thinking Skills Cultivation

Critical Thinking Skill	Mean	Standard Deviation
Interpretation	3.31	1.219
Analysis	3.18	1.158
Inference	3.00	1.213
Evaluation	3.03	1.236
Explanation	2.95	1.180
Self-Regulation	3.46	1.248

3.4 Results of Interview

In the initial phase of the study, aimed at garnering further comprehension of the rural English educators' perspectives on critical thinking and its nurturance, the replies to Questions 1 and 2 were consolidated. Upon inquiring about their grasp of the critical thinking concept (Question 1), the interviewees affirmed their acquaintance with the term, albeit at a rudimentary level. They demonstrated a preference for delineating their understanding based on tangible pedagogical strategies rather than adhering to rigid definitions. Their enlightenment on the subject was gleaned from both structured educational programs and informal channels such as print media, digital platforms like WeChat public accounts, and peer-to-peer dialogues. Regarding the necessity and feasibility of fostering students' critical thinking through question design in reading tasks

(Question 2), the responses were unanimously positive, recognizing the instrumental role of question crafting in the enhancement of critical thinking.

In the second phase, the objective was to enrich the understanding of the current state of critical thinking cultivation and to explore potential methodologies, as reflected in the responses to Questions 3, 4, and 5. The educators were queried about the integration of critical thinking skills in their question formulation for reading tasks (Question 3). The findings indicated a general, albeit inconsistent, incorporation of critical thinking skills in classroom reading exercises, irrespective of whether the questions were sourced from textbooks or created autonomously, with a pronounced emphasis on Analysis and Evaluation. When probed about the consideration of critical thinking dispositions in their question design (Question 4), the outcomes revealed an imbalanced approach, with a pronounced focus on bolstering students' confidence and inquisitiveness for truth, often at the expense of other equally important dispositions. A concerning number of educators exhibited a dismissive attitude towards the cultivation of critical thinking dispositions. On the matter of strategies for nurturing critical thinking through question design (Question 5), the majority offered responses that were nondescript and lacked theoretical precision. There was a conspicuous absence of the application of established theories on question types, with educators opting for more generic interrogatives.

In the final phase, addressing the educators' challenges and requirements for the cultivation of critical thinking, the answers to Questions 6 and 7 were synthesized. The educators identified several impediments to the development of critical thinking in rural English reading classes, as posed by Question 6, including the constraints of class time, the linguistic proficiency of students, the dearth of engagement from parents and educational institutions, and their own understanding of critical thinking. In response to Question 7, which sought to ascertain the kind of support they desired to bolster critical thinking in their pedagogical careers, the majority expressed a desire for professional mentorship in critical thinking, exemplars of exemplary lesson plans, and a more robust support system from familial, scholastic, and societal sources.

4 Discussion

4.1 Current Situation

Firstly, the development of critical thinking skills and dispositions among rural middle school students is characterized by a marked unevenness. While educators prioritize the cultivation of critical thinking skills, there is a discernible lack of emphasis on the equally important dispositions. Interviews with teachers revealed a significant number who possess only a rudimentary understanding of critical thinking dispositions. The students at these rural junior high schools tend to exhibit underdeveloped critical thinking dispositions, although their skills are assessed to be at a moderate level.

Secondly, rural English teachers demonstrate an awareness of the need to address a variety of critical thinking skills. However, they do not allocate equal weight to each skill. The distribution of questions across different sub-skills in reading classrooms suggests a variable emphasis on each aspect. Predominantly, activities that engage lower-

level thinking dominate the reading curriculum, indicating a focus on textual content and information processing. Classroom observations indicate that questions are often structured to enhance Interpretation and Analysis, while the development of Explanation and Self-Regulation skills is frequently overlooked. The emphasis on Interpretation may stem from a desire to reinforce foundational content understanding, while the Analysis skill is cultivated to help students understand text structure and discern internal relationships. The relative neglect of Explanation skills suggests that students are largely positioned as passive recipients of information, rather than active producers. Prolonged exposure to a singular mode of textual input risks entrenching a stereotyped thinking pattern among rural junior high school students. Furthermore, Self-Regulation skills are not sufficiently emphasized, possibly due to an over-reliance on questions with predetermined answers. Interestingly, teachers' focus on Evaluation during question design, as indicated in the questionnaires, does not align with students' abilities to meet these expectations, potentially due to a long-standing emphasis on skills such as Interpretation and Analysis, which may have led to an undervaluation of broader critical thinking.

Thirdly, it is evident that most rural English teachers do not give adequate consideration to critical thinking principles before formulating questions, resulting in an insufficient training in critical thinking for students. While the interviews indicated that teachers do contemplate critical thinking during the question design process, the discourse was limited to the component parts without a robust theoretical framework to underpin the design. Consequently, rural students are not receiving the comprehensive and thorough critical thinking education that they require.

4.2 Difficulties in Designing Questions

While rural English educators acknowledge the significance of critical thinking and concur on its viability as an educational goal, especially through the strategic design of questions, their comprehension of the concept remains somewhat nebulous. They express a robust consensus regarding the importance of nurturing critical thinking and are optimistic about its development through pedagogical questioning. However, the responses from these educators suggest a superficial understanding of critical thinking, often eschewing formal conceptualizations in favor of practical, classroom-based applications. The educators' grasp of critical thinking appears to be not fully encompassing, with a noticeable tendency to overlook the cultivation of critical thinking dispositions. Additionally, the development of critical thinking in rural English reading classes is impeded by a confluence of factors including students' English language proficiency, the school's assessment structures, and the inherent complexity of the critical thinking domain itself.

4.3 Methods to Design Questions

As detailed in the results section, it was observed that nearly 75% of the questions utilized in rural English reading classes are of a lower cognitive tier, specifically indicative in nature. The majority of these reading questions lack the depth required to stimulate

critical analysis or inferential thinking, suggesting that they are more aligned with prompting students to engage in rote memorization or regurgitation of information, rather than fostering activities that demand reflection, analysis, synthesis, and evaluation of knowledge.

Educators pose questions to identify learning challenges, facilitate learners' contemplation of their educational experiences, enhance cognitive abilities, stimulate discourse, and demonstrate engagement with students' intellectual pursuits. However, this does not imply that the utilization of higher-order questions should entirely supplant those of a lower tier. It is proposed that a balanced integration of all three types of questions be employed throughout a class session, thereby providing rural middle school students with exposure to the comprehensive range of cognitive levels essential for effective learning experiences.

Furthermore, rural English educators should deliberate on the proportional distribution of question types. There should be a measured avoidance of an over-reliance on indicative questions that pertain solely to the text, as such a practice limits students to the acquisition of factual knowledge and maintains their thinking at a rudimentary level. It is imperative that questions are crafted to address the principal content and central themes of the text. Additionally, educators must ensure a suitable quantity of referential questions to prevent potential misconceptions or superficial understandings of the material. Consequently, the equilibrium of these three categories of questions is paramount for the advancement of critical thinking competencies.

5 Conclusion

In summary, the current state of employing questions to foster critical thinking among rural middle school students is assessed to be moderate, yet it presents significant opportunities for enhancement. Firstly, the cultivation of critical thinking among these students is indeed extensive, but it is marked by an uneven distribution of skills and dispositions, as well as a general deficiency in comprehensive critical thinking training. Secondly, the development of critical thinking in English classes is impeded by several factors, including the educators' incomplete grasp of critical thinking concepts, the students' proficiency levels in English, the school's assessment frameworks, and the inherent complexity associated with critical thinking. Lastly, it is suggested that the strategic and flexible application of a diverse range of question types can facilitate rural students' exposure to various cognitive levels, thereby nurturing the development of critical thinking competencies.

Acknowledgments

This study is directed by Professor Li Bing and supported by College Students Innovation and Entrepreneurship Training Program of Huzhou University (no. S202310347100).

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