

A Study of AIGC-Enabled Rural English Classroom Interaction - A Perspective Based on the Flanders Interaction Analysis System

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Abstract: In recent years, the rapid advancement of digital technology has presented new opportunities for the development of rural education through digital transformation. The emergence of generative artificial intelligence (AIGC) has garnered significant attention, leading to an increased interest in its application within educational contexts. This study employs the Flanders Interaction Analysis System (FIAS) to investigate the feasibility of integrating AIGC into English classrooms in rural areas, focusing specifically on classroom interaction dynamics. The findings indicate that AIGC technology can enhance students' willingness to express themselves and participate, and mitigate the traditional teacher-student imbalance prevalent in conventional teaching methods. Furthermore, AIGC serves as a supplementary tool that bolsters the stability and adaptability of classroom interactions, although it still maintains a degree of detachment from the students. Future research should aim to extend the duration of practical applications, foster greater student agency, and explore additional modalities for AIGC integration in the classroom to achieve more comprehensive educational outcomes.

Keywords: Rural education; AIGC; Classroom interaction; Flanders analytic system

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1. Introduction

The differentiating developmental status of teaching and learning in rural areas is noteworthy and of great significance for education equity ^[1]. As the rural revitalization strategy progresses, rural education has emerged as a focal point, facing both unprecedented challenges and opportunities ^[2]. Rural English instruction, a critical component of education, continues to encounter numerous obstacles. In rural English classrooms, interactions between teachers and students tend to be superficial. The motivation beliefs of rural students towards English learning are markedly lower than those of urban students ^[3].

Digital technology is considered by educational researchers to play a key role in reshaping the education system and its ecology ^[4]. Currently, Artificial Intelligence Generated Content (AIGC) facilitates the transformation and advancement of educational digitization ^[5]. While there has been a growing interest in exploring novel applications

of AIGC, there remains a paucity of research focused on its implementation in offline classroom settings ^[6]. Consequently, this study aims to conduct empirical research on AIGC-enhanced teaching in rural classrooms.

2. Literature review

2.1. Analysis of the current situation of interaction in rural traditional English classrooms

In the educational context, “interaction” is defined as the reciprocal or multi-directional communication process that occurs between educators and learners, as well as among learners themselves, during the teaching and learning process, which underscores the importance of subjectivity. The concept of an equal teacher-student relationship is the precondition of teacher-student interactions ^[7]. Students’ engagement can be fostered with high-quality teacher–student interactions ^[8].

Currently, the traditional didactic teaching model is prevalent in rural English classrooms in China ^[9]. In practice, these teachers tend to prioritize the delivery of theoretical knowledge, resulting in monotonous and uninspiring classroom experiences. Teachers in rural schools refuse to acknowledge students’ contributions, disengage involvement and language use on the part of the students, limit students’ participation ^[10], and consequently, reduce their learning opportunities. This pedagogical approach diminishes students’ interest in learning English and may even provoke resistance to the subject ^[11]. In fact, it is believed that classroom interaction in EFL classes can be used to build knowledge and improve students’ language skills ^[12].

2.2. Classroom interaction analysis system

To effectively analyze the intricate nature of interactions, American scholar Flanders introduced the Flanders Interaction Analysis System (FIAS) in the 1960s. The FIAS coding system is primarily employed to examine the verbal exchanges between teachers and students, categorizing these interactions into ten distinct situations ^[13]. The traditional FIAS serves as a tool for recording and analyzing teaching behaviors and teacher-student interactions within educational contexts, yet it does not classify verbal interactions from a technological perspective. Consequently, the improved Flanders Interaction Analysis System (iFIAS) incorporates modifications to the Information Technology-based Interaction Analysis Coding System (ITIAS), resulting in a framework that is more suited to the typical digital classroom environment ^[14]. This study aims to further adapt the iFIAS to create an index system applicable to classrooms that incorporate Artificial Intelligence Generated Content (AIGC), facilitating a quantitative investigation of teacher-student interactions (**Table 1**).

Table 1. FIAS code list

Categorization	Encodings	Code name
Teacher talk	1	Teachers accept feeling
	2	Teachers praise or encourage
	3	Teachers accept or use student’s perspectives
	4	Ask questions
	5	Lecturing
Student talk	6	Orders or instructions
	7	Criticizing or defending authority
	8	Student talk: response passively
Silence	9	Student talk: question proactively
	10	Silence or confusion

3. Research design

3.1. Research problem

This study seeks to investigate two primary research questions grounded in the existing literature:

- (1) To what extent does the implementation of generative artificial intelligence (AIGC) in educational settings influence interactions between rural teachers and their students?
- (2) What strategies can be employed to enhance interactions between rural educators and students in classroom contexts that incorporate generative AI, and what methods may prove to be particularly effective?

3.2. Methodology

This study employs a case study approach and utilizes the AIGC Special Classroom Teacher-Student Interaction Quality Evaluation Index System to analyze interaction patterns. Furthermore, interviews were conducted with a randomly selected group of students. In this research, the Delphi method was employed to develop a suitable evaluation index system for this study, as presented in **Table 2**.

Table 2. AIGC Special Classroom Teacher-Student Interaction Quality Evaluation Index System

Categorization	Encodings	Code name
Teacher talk	1	Self-initiated Scaffolding
	2	Scaffolding
	3	Assisted Scaffolding
	4	Students Utilize
	5	AIGC Utilizes
	6	Teacher-student Conversation
Student talk	7	Practice and Consolidation
	8	AIGC Sessions
	9	Peer Assessment
	10	Student Assessment
	11	AIGC Assessment
	12	Group Discussion
AIGC talk	13	AIGC Debate
	14	Proactive Inquiry
	15	Proactive Response
	16	Passive response
Silence	17	Teaching Resource
		Role-playing
		Unhelpful Chaos
		Beneficial Silence

4. Results & discussion

Based on frequency calculations, this study created a classroom speech structure ratio analysis table and a line graph, as illustrated in **Table 3**.

Table 3. Classroom interaction structure analysis table

Case	Teacher	Student	AIGC	Teacher-to-Student Ratio
1	33.33%	27.78%	11.11%	1.2
2	28.13%	37.50%	9.37%	0.75
3	29.03%	35.48%	12.90%	0.82
4	33.33%	40.74%	14.81%	0.82
5	33.33%	40.00%	13.33%	0.83
6	32.43%	27.03%	10.81%	1.2
7	31.03%	27.59%	6.90%	1.12
8	35.71%	28.57%	14.29%	1.25
9	45.00%	25.00%	10.00%	1.8
10	40.91%	31.82%	9.09%	1.29
Average value	34.22%	32.15%	11.26%	1.108

Teachers and students remain the primary participants in the classroom compared to the AIGC tool. In this study, the teacher does not fully dominate the classroom dynamics and allows for more opportunities for student speech; students are more engaged in classroom activities and interactions, expressing their perspectives more effectively. Besides, AIGC has taken on some of the teacher's roles in this study, aiding the human teacher in facilitating teaching and learning activities.

5. Conclusion

5.1. Teachers and AIGC collaborate in teaching, constructing an “AIGC-Embedded Classroom” model

In the contemporary educational landscape, teachers remain a pivotal component of the classroom and should serve as models and facilitators of digital competence^[15]. while AIGC is more appropriately positioned to play a supplementary role. The auxiliary function of AIGC in the classroom facilitates a more balanced classroom discourse structure. Under the “AIGC-embedded classroom” model, teachers and AIGC collaborate through a division of labor, leveraging their respective strengths to enhance classroom efficiency and engagement. Teachers are primarily responsible for emotional and creative teaching, such as grammar and writing instruction, while AIGC assists in improving students' listening, speaking, and reading skills, collectively propelling educational innovation. It is evident that the routine application of AIGC in the classroom is feasible and holds promise for enhancing educational outcomes.

5.2. Research limitations

The participants of this study were seventh-grade students from rural schools, who had just begun to be exposed to English according to the learning progress of rural schools. Given that, the curriculum developed for rural students does not incorporate advanced cognitive training. Instead, it places a greater emphasis on foundational skill development and straightforward interactive learning modalities. While this approach facilitates students' initial grasp of basic English skills, it may overlook individual differences in English learning and the cultivation of higher-order thinking abilities.

Moreover, the current curriculum design fails to adequately address students' deficiencies in digital literacy, which may slightly impede their effective interaction with AIGC. Although AIGC tools hold the potential to enhance students' motivation and engagement, their interactivity may be constrained by students' lack of digital literacy, potentially undermining students' self-confidence and motivation in the short term.

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Disclosure statement

The authors declare no conflict of interest.

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