

A Case Study of a Chinese High School English Teacher's Journey Integrating AI into Listening-speaking Classrooms

Feili Zou^{1*}

¹ Zhaoqing City Teacher Development Center, Zhaoqing Education Bureau, Zhaoqing, China

Email Address

zoufeili_tclp@163.com (Feili Zou)

*Correspondence: zoufeili_tclp@163.com

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Abstract:

The artificial intelligence (AI) powered-classrooms have become a buzz word in China for its potential to bridge the gap between urban and rural education. Many schools have installed various platforms and systems to boost the use of AI in daily teachings in the hope of improving the effectiveness and efficiency of formative assessments to evaluate students' performances. However, it remains unknown about the teachers' conceptions when integrating AI into their traditional way of teachings and the factors related to the success of adopting AI. To reveal the conceptions and to dig out the factors involved, this case study focuses on a senior high school English teacher's (Anna, pseudonym) experience of integrating AI into her listening and speaking classes. Using data such as lesson plans collection, classroom observations, interviews and reflective journals, the findings show that while AI-powered tools promotes median and low level students' class engagement through immediate feedback and diverse assessments, it draws little interest from high achieving students, for they favour face-to-face communication rather than reading the platform's assessments. In other words, they do not need the instant feedback to push them learning further. Anna's extrinsic and intrinsic motivations play a key role in the successful adoption. The findings of this case study are helpful for developing the educational policy to allocate of AI resources as well as to shed light on teacher training.

Keywords:

AI-powered Classrooms, Listening and Speaking, High School English

1. Introduction

The importance of listening and speaking activities in human communication is highlighted in Rivers' work [1], which calculates that "listening" makes up 45% of the total communication and "speaking" occupies 30%. All together, these two parts account for three quarters of human communication, while "reading" and "writing" only respectively account for 16% and 9%. The significance of English listening and speaking education is partly reflected in China's entrance college examinations. Take

2024 China's English college entrance examination [2] for example. The full score is 150 points, of which listening accounts for 20%, reading comprehension making up 33%, reading and writing application taking up 20%, while writing accounts for 27%.

The emphasis of the function of language communication in some first tier cities and provinces like the capital Beijing and the southern province Guangdong is reflected in their entrance college examinations, which have reformed the national listening test items into the computer-assisted listening and speaking tests [3]. The purpose is to gain the positive wash-back effect of this high-stakes examinations in the high-school education in the areas, and so as to boost teachers to teach listening and speaking in their daily teachings [4].

The benefits of AI-powered tools integrated into English lessons are convincing shown in the numerous researches, ranging from using the AI-powered flipped classroom to engage students [5], providing personalized exercises to address learners' weakness [6], to adopting ChatGPT to enhance instructional efficiency [7]. Among the academic community, researchers like Weizhi Wang [8] concerns about the data privacy, biases, and resource imbalance when adopting AI into education. Liu Ying [9] investigates teachers' metacognitive awareness, which is an important factor affecting a teacher's classroom teaching quality in AI-powered classrooms. When a teacher engages in a new teaching activity, Professor Xu Yueting [10] discusses the vulnerable teacher learning in the process. Coming to the factors which affect a teacher's integration of AI in the classroom teachings and the teacher's conceptions towards the process of adopting the AI-powered classrooms, it remains unclear in these researches.

This study aims to find out the factors involved in a teacher's adoption process as well as the teacher's conceptions towards using AI, through investigating a case of teacher (Anna, pseudonym) of integrating AI-powered tools in the high school listening and speaking classes by the qualitative analysis, such as lesson plans collection, classroom observations, interviews and reflective journals, to shed light on a teacher's metacognitive awareness [9] when adopting AI-powered classes, in the hope of offering theoretical insights and practical guidance for education policy making, teaching practices and teacher training.

2. Method

This single case study prioritizes the understanding of the journey of how a teacher embraces the AI powered classes, with the growing body of researches endorsing the effectiveness of AI tools in enhancing teaching practices [11]. An intensive case study is able to explore the complex territory of a person's perceptions, or rather conceptions as well as the motivation behind. It does not only aims to find out one's extrinsic motivation [12], encouraged by the education policy orientation, but also one's intrinsic motivation, which is the key factor affecting the success of AI integration. Based upon a case teacher's (Anna's) experience of leveraging AI-powered tools in her two 11th grade English classes mixed up with different levels, this study tries to answer the following two research questions:

RQ1: What are the important factors that influence the teacher's adoption of AI-powered tools in listening and speaking classes?

RQ2: What are the teacher's conceptions towards AI-powered tools when integrating them ?

2.1. Context and participants

The Z Senior High School (pseudonym) where the study takes place is the key school in the local area and one of the 16 key high schools in Guangdong province, China, with its excellent teaching quality and well-respected reputation for its establishment of over a century and 2 decades. In recent years, the school administrators have promoted the information technology and innovation in teaching and learning, holding the summits of the provincial technological education forums actively in order to attract their teachers' interest in AI-powered education. Recently, the school has signed a deal with China Telecom Guangdong Branch to join the "China Telecom's AI+ Education Exploration and Practice" program, for the purpose of leveraging the DeepSeek large model in the intelligent campus daily management and AI-powered instructions. This partnership plans to create a fast-speed AI teaching and learning environment for its faculty and students. Hence, the faculty from this prestige school with promotion of AI integration are ideal to observe and study the factors and conceptions when using AI technology in the classroom teachings.

The author of this research paper works as a high school English teacher researcher in the local education bureau. Her job is to enhance English teachers' teaching practices so as to ensure the teaching quality in the school district, consisting of 43 high schools. The researcher has borrowed a set of AI-powered devices from the education bureau, which looked like remote controls (illustrated in Figure 1). These devices can be used to record voices and to choose the answers of multiple choice questions by pressing buttons. The devices should be connected through the wireless network to a certain installed platform on the computer. Teachers who use these AI-powered tools, need to log on the platform before the lessons, upload the list of students' names beforehand. When teachers prepare their teachings, they shall choose the existing teaching materials or creating their own on the platform, so that these resources can be used later in class. When students start to use these AI devices in class, they first need to log on their identity numbers on the remote controls. The platform should be projected on the classroom's big screen, so that both the teacher and students can see the platform's instant feedback about students' pronunciation and answers after they use the tools to record their voices and choose answers by pressing buttons.



Figure 1. The AI -powered remote control.

The researcher chose one of the English teachers from the Z Senior High School to experiment the AI-powered tools used in class, because most teachers have already got to know about the AI education for the school's active promotion. Anna, with 10

years of teaching experience, was interested in the research. She promptly answered the call to install the platform in her two classrooms and promised to use the AI remote controls in her listening and speaking classes each week in the length of two months for a period of 40 minutes.

Her peer teachers of 11th grade agreed to serve as an advisory team for her, to observe her AI-powered classes and to give feedback to her about her teachings. The peer group consists of 11 English teachers. All of them teach the same curriculum and approximately the same materials for each time block.

2.2. Data collection

Data collection continues for a two-month's time. The researcher collected three sets of data. The first set was Anna's reflective journal entries about her experience of using AI-powered tools in her listening speaking classes. In two-month length, she altogether wrote ten entries in English, ranging from 50 to 80 words. The second type of data was three interviews, which took place at the beginning week of the experiment, at the middle of the first month and at the end of two months time. She talked about her first week of using the AI-powered tools, then gradually deepened her perceptions of it, and finally formed her conceptions about the implementation of AI in education. The third set of data derived from her teaching plans collection after the advisory group's class observation, discussion and feedback, recording how she adapted her teachings to students' responses when using the AI-powered tools.

2.3. Data analysis

Data analysis began from coding the teacher's 10 reflective journal entries and 3 interviews [10] in order to give a big picture of the factors involved and the teacher's conceptions of AI-powered tools. The coding collected the 5 types of recurring themes and 12 categories of statements which supported the themes. Table 2 shows the contradictory two types of themes and categories, including using AI-powered tools to gain a better way of teaching and being a waste of quality teaching time. The following themes are improving students' willingness to talk in English and diversifying assessments. The fifth recurring theme concerns about the students' English levels. Table 3 compares the traditional teaching steps, the initial stage of using AI-powered tools, and the later stage after ample classrooms observations, advisory group discussions and giving feedback to Anna. Accordingly, Anna changed her initial stage of teaching plan into the later stage of teaching plan and gave a lesson to other 11th grade classes belonging to the advisory group's.

Table 2. *Recurring themes, supporting categories and coding times.*

Recurring themes	supporting categories	coding times
1 A better way of teaching	learn a new skill to improve teaching	2
2 A waste of time	preparing teaching materials on the platform	2
	waiting for students to log on	4
	waiting for students to press the buttons	3
	waiting for students to record answers	3
3 Improving willingness to talk	love to talk to the machines	2
	free from the embarrassment of face to face communication	4
	get encouraged from the instant feedback	3
4 Diversifying assessments	prompt individual assessments	4

	group competitions	3
5 Different levels of students	no need for the high level students	2
	good for median and low level students	2
Total coding		34

Table 3. Comparison of teaching steps of listening and speaking teaching plans.

Materials	Unit 5 First Aid (Senior High School Selective Compulsory Course Book Learn to Call Emergency Services (pp. 54-55 Listening and speaking)		
Goals	Be able to call emergency services in English		
Teaching objectives	a. State the emergency numbers of different countries; b. Identify the ordinary medical emergency incidents and describe the situations that require the first aids; c. Comprehend and summarize the emergency instructions on the phone; d. Analyze the emergency situation and perform rescue actions.		
Teaching activities	1. Match the pictures with the medical emergencies; 2. Describe the emergency incidents given on the textbooks; 3. Listen to a 999 call made in England, get the main idea, and number the order of the instructions the operator gives; 4. Role-play the rescue actions.		
Short forms	Teacher (T); Students (Ss)		
Comparison	Traditional teaching steps	Initial stage of using AI-powered tools	Later stage of using AI-powered tools
Pre-listening activities			
Step1	T shares about her own experience of calling emergency number and asks Ss whether they have one. If they have one before, share it in front of class.	the same	the same
Step2	Ss read aloud the medical emergency vocabulary: drown, sprain, ankle, bleeding, bleed, panic, interrupt, scream, obstruction, collapse, foggy, mouth-to-mouth rescue breathing...	Ss use AI remote controls to record their pronunciation of the vocabulary, and T praises those who get all correct pronunciation.	T replays students' right pronunciations on the platform and compares to those not getting right. Ss listen to the differences and correct their own pronunciations.
Step3	Ss match the pictures with the names of medical emergencies on the textbook and describe the situation in groups.	Ss use AI remote controls to choose the pictures and assess students' answers on the big screen. And then Ss record their descriptions of the emergency situations with AI remote controls.	Ss match the pictures with the names of medical emergencies on the textbook and describe the situation in groups.
Step4	Ss in pairs predict the content of the following listening content based on Step 3 activity	the same	the same
While-listening activities			
Step5	Ss listen to a 999 call made in England and share the main idea of the call.	Ss listen to a 999 call made in England and choose the main idea of the call with AI remote controls. The Ss who get the right answers will be praised.	Ss listen to a 999 call made in England and choose the main idea of the call with AI remote controls. T replays the audio again for Ss to

			confirm the answer.
Step 6	Ss listen again and number the instruction order that the operator gives on the textbook.	Ss listen again to choose the right order of the instructions sequence with AI remote controls. The Ss who get the right sequence will be praised.	Ss listen again to choose the right order of the instructions sequence with AI remote controls. T replays the sequence of instructions again for Ss to listen to the details.
Step7	Ss read the text of the dialogue and analyze the language features of making an emergency call.	the same	the same
Speaking			
Step8	Ss role play the emergency accidents on the textbook as victims, rescuers and telephone operators.	Ss use AI remote controls to record their pronunciation of each role when they speak. T praises those who get all correct pronunciation.	Ss role play the emergency accidents on the textbook as victims, rescuers and telephone operators.

3. Results

The results are stated following the sequence of five recurring themes in Anna's journals and interviews. The reasons behind these changing themes are largely explored in the comparison of the teaching steps.

3.1. A better way of teaching

Anna confessed that the reason why she promptly answered the call of doing the experiment was her desire to learn a new skill, so as to gain a better way of teaching listening and speaking lessons.

I hope to learn a new skill, so that I can teach better in the listening and speaking classes.

3.2. A waste of time

Comparing to a typical traditional English listening and speaking class, Anna thought that preparing the teaching materials on the platform before the class, waiting for students to log on their school numbers, tracking their names on the big screen, waiting for them to record their pronunciations and to press the buttons on the remote controls, at the initial stage, when both the teacher and students were not familiar with AI-powered devices, all of the above extra work was such "a waste of time".

I should have finished the vocabulary part within 5 minutes. Now I had waited for students to log on their numbers for 10 minutes, and waited for them to record their voices for another 5 minutes. What a waste of quality teaching time!

Apparently, Anna has a fixed schedule about the time spent on each activity. When using a new device in class at the initial unfamiliar stage, she complained the cost of time which should be used on the learning tasks, instead of logging on or recording voices. At the beginning, she rigidly required her students to use the AI remote controls in every teaching step as many as possible, which was demonstrated on the initial stage of teaching Step 2;3;5;6. As she believed that the AI-powered tools were effective and quick to show which student gets the right answers and correct pronunciations. However, after advisory group's observation and feedback, she only

used the AI-powered devices when it was necessary to see who needed help with the current task, making good use of the AI assessments to assist learning, not just for the teacher to praise some top students' performances. Therefore, she played the correct pronunciations and the audio students' clips to help those who did not catch up, as shown in later stage of teaching Step 2; 5; 6.

Somehow, using these devices in class would waste a bit of time, but it was worthwhile to wait a while, because I can get to know who was struggling and needed help. So I can intervene and offer help.

3.3. Improving willingness to talk

At the initial stage, Anna was eager to use AI-powered devices in her each week's 40 minutes of listening and speaking classes, because she saw her students were being freed from the usual embarrassment to talk in English face-to-face. So she used the devices in any possible step and praised the students' responses.

These devices were so useful! They now can talk to the machines and not to be afraid of losing face in front of classmates. I like it!

One of the benefits of AI-powered tools is to free students from the embarrassment of making oral mistakes in classroom teaching. If the students were not willing to talk in listening and speaking lessons, it is hard to learn anything. Therefore, at the beginning stage, Anna was pleased to see her students talking to the remote controls. However, as shown in the later stage of the teaching plan of Step 3 and Step 8, Anna returned to the traditional way, as she was advised that this AI-powered platform could only judge the pronunciations and was not able to assess the content of the free speech. So it was not appropriate to use AI-powered tools with Step 3 and 8.

3.4. Diversifying assessments

The AI-powered tools employed in class not only provide prompt formative assessment to all students, but the platform can also offer the teacher to divide the students into groups. For example, the teacher can click random numbers of the students on the platform to form a Red camp and the rest as a Blue camp to organize a competition between two groups.

The platform is convenient to organize competitions. The students love to compete against each other!

Individual assessment is one thing, but group competitions are so much fun!

3.5. Different level of students

Anna found that the high-achieving students in Anna's class were not as interested in AI-powered tools as the median and low level students. These tools were not the incentives to push high level students to learn. They were attracted by the teaching content and authentic communication, not fond of the prompt and quick evaluations or lousy competitions.

I found the high level students were not interested in these high-tech devices. They tended to talk face-to-face with other high-achieving peers.

I could tell from their faces the good students felt bored with these shining machines!

The median and low level students were encouraged and got immediate assistance from the teacher's interventions. They were used to be a group of silent learners in listening and speaking classes. Now their voices were recorded and assessed, so that the teacher could offer extra help.

Now I can see my old teaching was too fast for the median and low level students. These tools helped me to get to know where to stop and offer help to these level of students.

4. Discussion

After exploring the recurring themes in the reflective diary entries, interviews and the changes of teaching steps, the researcher will proceed to answer the two questions raised at the beginning, concerning about the factors which affects the teacher's adoption of AI-powered tools and the teacher's conceptions towards AI-powered tools.

4.1. Extrinsic and intrinsic factors

The administrators of the school in question encourage teachers to explore the AI+ education at the first place, so that teachers understand their exploration behaviors in class are permitted, which is extrinsic factor. Turning to the teachers themselves, they should be willing to learn a brand new skill, starting from the very beginning and commits to spending enough time on it, whether to learn the various functions of platforms or websites or systems, combining with handling the devices independently in class. On the way to AI integration, they are at ease when needing to correct over-use of technology even though they really love the technology. They can take the needs of different levels of students into consideration and use AI accordingly. The intrinsic factors are eagerness to learn AI technology and easiness to correct mistakes along the way.

4.2. Conceptions towards AI-powered tools

For those who are willing to try AI-powered tools in their classes and committed to learning the skills involved. Their conceptions go from excitement towards the ability of the new technology and excessive use of it in class, to calmly and objectively use it according to the need of different students. For example, in this case study, the tools made the usual silent students free from the embarrassment of talking in front of class. The teacher was encouraged to use the tools in every possible step. Even in the activity of role-play, which emphasized the meaningful face-to-face communication in a sheltered environment, the teacher asked the students to record their pronunciations, which was not the point of this activity at all. Then after the advisory group's correction and guidance, the teacher realized that it was good only using the AI tools where they were needed. After using the AI-powered tools for a month, the teacher's original enthusiasm decreased, and began to objectively perceive the different effects on different levels of students.

5. Conclusions

Based on the exploration of the factors influencing teachers' adoption of AI tools in class, this study reveals the importance of the combination of extrinsic and intrinsic motivations in urging teachers to learn AI teaching skills, specially the intrinsic part, which was the key factor to conquer the troubles of spending time and energy to learn a new skill and willingness to change any mistaken teachings along the way. This

single case study presents the changing conceptions of using of AI-powered tools, from eagerness to use as much as possible to cautiously matching the needs of diverse levels of students. This case study sheds light on the process of a teacher's adoption AI technology in class, providing valuable ideas for the policy making of allocating AI resources and for the AI integration of teacher training.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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