New Age Information Fusion Technology-Based Unique Multimedia Teaching Methods for English

Wen Zou, Dongguan Polytechnic, China*

ABSTRACT

English listening multimedia teaching courseware has the characteristics of both illustration and text, sound, and shape and provides a variety of possibilities for modern English listening teaching methods. Considering students' unique psychological characteristics such as strong self-awareness, physiological characteristics such as strong abstract thinking ability, and relevant theories such as schema theory and constructivism, this paper proposes that high school English listening multimedia teaching courseware can be innovative in many aspects. Multimedia is more and more widely used in the society, and the combination of multimedia and teaching is getting closer and closer. Through multimedia teaching, more teachers' resources are integrated, and students' extracurricular knowledge is broadened. This combination of multimedia and teachers achieves a different teaching effect than before. Due to its graphic, audio, and visual characteristics, it provides a variety of possibilities for modern English listening teaching methods.

KEYWORDS

English Innovation, Information Fusion, Multimedia Teaching, Teaching Method

INTRODUCTION

Schools are undergoing major changes in teacher training, teaching systems, teaching techniques, and teaching tools (Riadynska, 2021; Veigas et al., 2021). Such concepts and the teaching concept of the modern network era—for example, online classrooms, micro-classes, and flipped classrooms—are in a fierce collision (Shodmonbekova & Zakirova, 2020). Courseware and electronic whiteboards have gradually become the protagonists of the classroom (Teye et al., 2020; Yusuf & Tilfarlioğlu, 2020). With the continuous development of the economy in Hanzhong in recent years, the modernization of education in Hanzhong has also closely followed the pace of the times (Imania et al., 2021); for example, applications of multimedia courseware for teaching English have been employed in primary and secondary schools (Fuente & Otaño, 2021). First, the necessity of multimedia teaching courseware innovation was clarified; second, to ensure the smooth implementation of multimedia courseware teaching, innovative research was carried out on the teaching management of high school English

*Corresponding Author

listening multimedia courseware. The design and production principles of high school English listening were innovated. Finally, the specific production method of multimedia courseware was clarified, and the specific production method of high school English listening multimedia courseware was innovated and illustrated with examples.

Such a combination of multimedia teaching and traditional classroom teaching provides more possibilities for the classroom practice of today's students (Kulmagambetova & Shalabayeva, 2021). At the same time, it also greatly adds a sense of intelligence to the traditional classroom. Multimedia teaching breaks the traditional teaching classroom practices (Galynska et al., 2021); for example, it increases the attractiveness of primary school students' classroom learning (Rusnak & Vasylyk, 2021). The use of multimedia teaching not only makes traditional classrooms more interesting but also brings new-era changes to traditional classrooms (Juan & You, 2021).

The teaching mode combined with information technology can create a student-oriented, interesting English classroom. Furthermore, through the interesting teaching display combined with multimedia teaching, this type of teaching can help students learn classroom knowledge efficiently and promote a new way of teaching (Liu & Li, 2021). Light-burdened and high-efficiency English classrooms allow students to more intuitively understand the English knowledge points contained in the classroom, promote students' logical expression in English, and enable students to digest and absorb knowledge better than in traditional teaching classrooms, rather than just learning it (Maričić et al., 2020) by use of a more rigid "tool" such as a book. In primary school, multimedia can systematically and rationally plan classroom teaching objectives (Geng, 2021). During the process, students develop and accumulate good English thinking ability. At the same time, students are dependent on multimedia teaching (Zhao, 2022). Primary schools should also adopt information-based education methods (Bai & Zhang, 2020).

At this stage, there are many ways of teaching English in primary schools, but to keep up with the times, combining teaching with multimedia technology is still necessary (Bi et al., 2021). The traditional English teaching model is caught in the predicament of false and empty space (Wu, 2021). There are few connections and interactions between the substantive education, teaching links, and English subject teaching (Hou et al., 2020). The quality and level of English classroom teaching are not promising (Fu & Fu, 2020). To avoid this deficiency, teachers need to integrate more multimedia teaching methods into their classrooms. Carrying out English teaching combined with multimedia teaching can intuitively and efficiently present abstract or difficult-to-explain English knowledge to students and stimulate students' knowledge of English. In addition to generating enthusiasm for exploring English theorems, English teaching combined with multimedia helps students to understand the difficulties of memorization, learn more deeply, and have less after-school learning pressure (Tursunova, 2020). Teachers can create some English situational expansion for students that combines with real life to stimulate students' creativity (Zhang, 2022). In the modern educational environment, teachers are the main bodies, organizers, and evaluators of the classroom; they also play a leading role in whole English teaching (Shi & Cui, 2021). In English learning, some knowledge is relatively abstract, so teachers should combine information technology, rationally design information-based teaching plans, show intuitive English teaching in the classroom, encourage students to actively understand learning, and encourage students to participate in English situations and classroom learning (Smirnov & Levashova, 2019). The use of multimedia in our society is becoming more and more extensive, and the combination of multimedia and teaching is becoming more and more intertwined. Using multimedia teaching, not only integrates more teachers' resources but also broadens students' extracurricular knowledge. Such a combination of multimedia and teachers achieves different effects from the past. Because of its characteristics of taking both pictures and texts into account, as well as sound and shape, multimedia provides multiple possibilities for modern English listening teaching methods (Wang & Zhang, 2018). Considering the students' unique psychological characteristics (such as strong self-awareness), physical characteristics (such as stronger abstract thinking ability), and related theories (such as schema theory and constructivism), I propose that the multimedia teaching courseware for high school English listening can be innovative in many aspects.

MATERIALS AND METHODS

Overview of Multimedia Teaching

Multimedia courseware (courseware) is produced by teaching staff according to their creativity; teachers use text, graphics, sound, animation, and other multimedia materials to explain certain learning theories. It is an interactive, integrated, and intelligent teaching aid.

Proficiency in using multimedia courseware for teaching requires a certain understanding of this type of courseware. What hardware equipment and software tools are required in the production of courseware? What external environment support does the courseware need in use? If teachers know these problems well, even if there are some small faults in the courseware in the classroom, teachers can easily solve them without affecting the whole classroom. The reason why multimedia teaching can stand out in the new era is that it uses images, sounds, words, and other media to display the teaching content, thus making the text content more vivid and interesting. Multimedia teaching allows students to integrate into the classroom atmosphere independently and engage in courseware production. To achieve effective integration of multimedia courseware in classrooms, teachers should use the teaching textbook as a template, and their multimedia courseware cannot be separated from the textbook content.

To make multimedia courseware, you must first have a set of hardware equipment. Without equipment, there is no way to make it. The set consists of at least one computer and other external devices, such as a host, video equipment, audio equipment, and an input/output device. I briefly describe these components here.

Host

The host is the core component of the hardware, and it is a chip dedicated to multimedia. The simplest host consists of a CPU, memory, and power supply.

Video Equipment

Video equipment is responsible for the ingestion and playback of videos and pictures in multimedia. It consists of various graphics cards. Its main job is to convert signals into digital video and play them out. The signal sources can be cameras, discs, TV signals, and compressed video files. Common video formats are mkv, flv, rmvb, wmv, mp4, 3gp, and mpg.

Audio Equipment

Multimedia audio equipment is responsible for outputting various types of audio, including sound cards, speakers, headphones, and other equipment. Common audio formats are CD, OGG, MP3, WMA, WAV, and APE.

Input/Output Device

A multimedia input/output device interacts with the outside world. Common input devices include video recorders, cameras, scanners, tape recorders, microphones, USB flash drives, and data cables. Common output devices include displays, projectors, stereos, headphones, and printers.

In addition to hardware devices, software is also an indispensable part of multimedia. The software includes computer system software and special software for multimedia courseware production.

A multimedia classroom has been called many names. It was first called electric classroom, and later, was referred to as comprehensive electric classroom, multifunctional classroom, and multimedia classroom. This evolution of different names is due to the continuous upgrading of its equipment. A common multimedia classroom is composed of a computer, a projector, a sound system, a central control system, and a display system, as shown in Figure 1.

As Figure 1 shows, the core part of the multimedia classroom is the computer and the central control system. The simplest multimedia teaching is that the computer processes and reflects the signal

Figure 1. Multimedia classroom structure
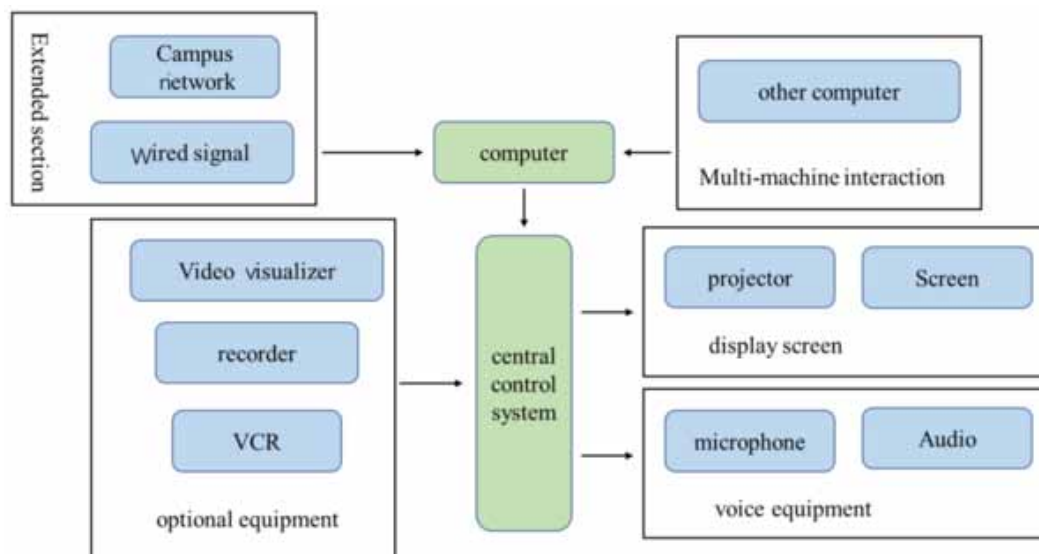
to the central control system, and the central control system drives the display device and the voice device for multimedia teaching. Computers can also use external databases, such as campus networks and wired signals; these additions can enrich multimedia resources. A complete central control system should also include external equipment, such as a video display stand, audio recorder, and video recorder. A multimedia classroom is the prerequisite for multimedia teaching, and multimedia teaching can be carried out only when there is a multimedia classroom. The expansion of multimedia teaching depends on the advanced nature of multimedia classroom equipment.

Multimedia Development Measures

Developing a multimedia classroom consists of these five measures.

Grasp the Opportunity of Multimedia Application

Courseware alone is far from being able to take advantage of multimedia teaching. Teachers also must have a systematic, comprehensive understanding of multimedia teaching, and they need to reasonably grasp the "timing" problem of multimedia applications. Reasonable application of multimedia will produce unexpected effects.

Highlight the Effect of Multimedia in "Turning Corruption Into Magic"

English grammar has always been a difficult point in English, and the use of attributive clauses and non-predicate verbs has always been the top priority of English teaching in high school. Because of the differences between Eastern and Western cultures, our thinking is fundamentally different from that of the West. When learning grammar, we always use our mindset to understand and learn English grammar, so that many jokes are made. This question has always been a major problem in English teaching. The emergence of multimedia teaching provides a possibility to solve this problem. It can use video, animation, or other tools to show some abstract, obscure grammar in English with vivid examples, thus facilitating students' ability to understand the lesson. This is what we call "fun English."

The Innovative Design of Multimedia Should Pay Attention to Individual Differences

Because each student has a different ability to accept knowledge when using multimedia to design English exercises for teacher-student teaching interaction, different difficulty gradients should be designed according to the actual situation of students. Taking into account the learning needs of each student, teachers should effectively use multimedia to teach and pay attention to the individual differences of students. This approach will be of great help to English teaching.

Organically Combine Multimedia Teaching With Traditional Teaching

At present, in high school English teaching, the emergence of multimedia technology has made many teachers develop bad habits. After a class, only a few words are written on the blackboard, and teachers sit on stools and control the computer leisurely. These bad habits are a serious waste of multimedia technology resources. Therefore, teachers should change this teaching situation and organically combine multimedia teaching with the traditional teaching mode instead of only using the learning resources we have always had—the blackboard.

The Production of Multimedia and Courseware Should Depend on Textbooks

Multimedia English teaching that is separated from textbooks is tantamount to "stimulating the growth of seedlings."

Relevant Theoretical Foundations

Constructivism Teaching Theory

Constructivist teaching thought points out that the channel for learners to acquire knowledge should be through a specific situation; that is, in a specific social and cultural background, with the help of learning and other people, using rich materials inside and outside the classroom to construct meaning and to acquire knowledge. Multimedia can simulate the real world to create the best language environment, put students in the created situation, and make learners' listening and learning more effective. Multimedia can also use the function of human-computer interaction to help students construct meaning, promote natural learning behavior, and improve students' English listening ability.

Philosopher Immanuel Kant believed that when a person receives new information, new concepts, and new ideas, they can have meaning only by connecting them with the knowledge inherent in the mind. Multimedia courseware can show the background knowledge related to listening materials for students before listening training, prompting students to establish a certain knowledge schema before listening. and form new and more specific diagrams in the following information listening process and thereby complete the comprehension process.

Carrell and Esterhold (1983) divided schemas into "content" and "formal schemata." Content schema refers to the background knowledge related to the content of the material being heard. Before students start listening, teachers use multimedia courseware to let students understand the content and background of the article to a certain extent and help them predict what they are about to hear, which will make listening comprehension much easier.

Cognitive Learning Theory

Cognitivist learning theory suggests that human learning does not result from stimuli provided by the learner's external environment. Learning is the process in which learners actively integrate and construct knowledge, ultimately forming a unique mental framework.

Cognitivism pays more attention to the learner's cognitive system and the learner's mental structure; i.e., it emphasizes the learner's internal cognition. Therefore, for multimedia-assisted teaching in high school English classrooms, teachers not only create a pleasant learning environment

and prepare diversified learning materials for students but also pay attention to the process of multimedia-assisted teaching. Teachers interact with students in the classroom and let them enjoy expressing their views so that the teachers can observe whether the students' English learning effect has changed or not. Teachers can observe the psychological changes of students in the classroom and use multimedia teaching reasonably so that students can be full of enthusiasm and take the initiative in English learning and conversation.

RESULTS AND DISCUSSION

As a new teaching method, multimedia-assisted teaching conforms to the requirements of the development of the times and enters into the actual teaching activities of the English subject. Information technology combined with multimedia has a very important impact on English listening teaching. It can not only stimulate students' interest in English but also improve students' learning efficiency.

In this paper I tried to test whether multimedia can effectively improve students' English skills and English performance.

In this study, I used a comparative analysis method to select 136 junior high school students who are of the same age, with comparable education levels, and nearly the same basic situation of English proficiency. Sixty-seven of them used the traditional listening teaching method, and the other 69 used the multimedia teaching method combined with information technology. In addition, in this thesis, I also adopted the questionnaire survey method; after all the students completed the questionnaire, the questionnaires were collected one by one and each collected questionnaire was carefully sorted out and analyzed in detail to obtain the real information and understand the English listening status of all the students.

The questionnaires investigated the students' interest in English listening and their attitudes toward multimedia teaching in English learning. A total of 101 questionnaires were distributed with a 100% recovery rate, after which statistics and analysis were summarized.

The 101 students were divided into two parts: 50 students who received traditional listening teaching methods as the control group, and 51 students who adopted the combination of information technology and multimedia as the experimental group. After one semester, tests were conducted at different stages of the experimental teaching to verify the changes in students' attitudes toward English learning, English listening skills, and academic performance.

The experimental teaching started in the fall semester, and the textbook was chosen from the Renjiao version of the junior high school textbook. The teaching content was the first seven units of this textbook.

First, a two-part test was conducted. The first part was the pre-test before the experiment started, in which students' English scores, especially the listening part, were collected before the experiment started, and the pre-test reflected the academic differences in students' English listening skills. In the middle of the semester, 2 months after the start of the experiment, students tool a midterm exam to check the learning outcomes over the half semester. At the end of the semester, approximately 4 months after the pre-test, students took a final exam as a post-test. The total score of all three tests was 100. The comparison between the pre-test and the post-test showed changes in their English listening skills and English learning achievement.

EXPERIMENTAL RESULTS AND ANALYSIS

Testing and Discussion of Data

In this section I analyze and discuss the tests and questionnaires.

As Tables 1 and 2 indicate, the English scores and listening scores of the experimental group and the control group in the pre-test are very close to each other, which means that the English proficiency of the students in the two groups is basically the same. According to Tables 1 and 2, students in the experimental group made significant progress after the experimental teaching combined with multimedia. This fully shows that multimedia has powerful advantages over traditional English teaching. In terms of classroom learning divided into aspects, the students in the experimental group showed higher interest in learning English because multimedia teaching provided students with the opportunity to role-play, and multimedia teaching also provided them with the opportunity to practice English listening. Background knowledge for understanding context and improving English listening skills was gained.

Therefore, multimedia can help students build abstract knowledge on the basis of textbooks. The teaching process becomes more vivid and interesting, which helps them make more progress in English learning, especially in English listening practice.

Discussion of Pre-Tests and Mid-Tests

In Tables 1–4, EG stands for the experimental group, and CG stands for the control group.

Discussion and Analysis of Data From the Post-Test

The final exam was not very difficult. According to Tables 3 and 4, students in both groups made progress. After teachers applied multimedia in English teaching, the average achievement in English teaching improved by 8.8%, while the group using traditional English teaching methods (the CG) improved their English achievement by 6.8%. When the EGs and CGs are compared, although both

Table 1. Comparison of English scores of the EGs and CGs

| | Before Experiment | | After Experiment | |
	EG	CG	EG	CG
90–100	4	6	8	6
80–90	11	13	10	14
70–80	15	11	16	14
Under 70	21	20	17	16

Table 2. Comparison of listening scores between the EGs and CGs

| | Before Experiment | | After Experiment | |
	EG	CG	EG	CG
15–20	3	2	12	6
10–15	10	9	21	14
5–10	31	28	17	20
Under 5	7	11	1	10

Table 3. Comparison of overall english scores on the post-test

	Before Experiment	Midterm Exam	Final Exam
EG	54.6	61.2	63.4
CG	54.4	60.3	61.2

Table 4. Comparison of English listening scores on the post-test

	Before Experiment	Midterm Exam	Final Exam
EG	10.01	12.42	13.05
CG	8.62	9.27	10.37

groups improved to different degrees, the EG's achievement improved more and did better after using multimedia in English listening teaching.

The EG's English listening scores improved by 3.04%, which made their total scores improve as well. Overall, the listening scores of the experimental group were higher than those of the control group.

In addition to the improvement in academic performance, the students in the EG had a strong interest in English and maintained their learning attitudes well; however, the students in the CG had a dull learning atmosphere and their academic performance did not improve significantly because traditional teaching did not help to cultivate interest in learning to a large extent. This finding explains why the students in the CG did not show much change in their listening scores in the test.

Data Analysis of the Questionnaire

The questionnaire included students' attitudes toward multimedia applications in English teaching and students' attitudes toward teachers' use of multimedia in English listening instruction (Table 5).

Students' attitudes towards multimedia in the process of English learning were investigated. On the item of the necessity of using multimedia devices in English listening, a total of 64.4% of the students (10.9% chose very necessary, and 53.5% chose necessary to think) had the necessity of using multimedia in learning English listening, and 35.6% of the students (26.7% chose indifferent, and 8.9% chose unnecessary) had positive attitudes toward the application of multimedia in learning English listening.

Regarding the effect of multimedia on learning English listening, 89.1% of the students (7.9% chose very satisfied, and 81.2% chose satisfied) expressed their interest in using multimedia in English listening practice, and 8.9% of the students thought that multimedia was generally used only an average amount to increase their interest in English listening learning. The remaining 2.0% of the students were dissatisfied with the use of multimedia in English learning process.

Regarding the question of how the students think the English teacher's lessons are, 96.0% of the students (18.8% chose very good, and 77.2% chose good) were satisfied with the English teacher's lessons, whereas only 4% of the students thought they were average.

In terms of students' interest in English multimedia in English listening class, 94.1% of the students (10.9% chose very interested, and 83.2% chose interested) showed great interest. Only 5.9% of the students thought that it did not help them much in their English learning.

Most of the students showed great interest and satisfaction in the use of multimedia in English listening practice. Multimedia shows its advantages in stimulating students' interest in English learning.

In conclusion, the students' positive attitude toward multimedia, which helps to improve their English skills, and the student's satisfaction with the use of multimedia in English listening instruction show the strong advantages of multimedia in English listening instruction.

Table 5. Students' attitudes toward multimedia in English listening

Research contents	Options	Numbers of responses	Percentage
Necessity of using multimedia devices on English listening class	Very necessary	11	10.9%
	Necessary	54	53.5%
	Indifferent	27	26.7%
	Unnecessary	9	8.9%
Effects of MAI on English listening class	Extremely satisfied	8	7.9%
	Satisfied	82	81.2%
	Just so-so	9	8.9%
	Unsatisfied	2	2.0%
	Extremely unsatisfied	0	0.0%
Think of teacher's courseware	Extremely good	19	18.8%
	Good	78	77.2%
	Just so-so	4	4.0%
	Bad	0	0.0%
	Extremely bad	0	0.0%
Students' interests in applying MAI on English listening class	Extremely interested	11	10.9%
	Interested	84	83.2%
	Just so-so	6	5.9%
	Uninterested	0	0.0%
	Extremely uninterested	0	0.0%

Note: MAI Stands for Multimedia.

CONCLUSION

This study shows that traditional English teaching cannot effectively improve secondary school students' English listening skills and achievement. Because traditional English teaching methods focus only on students' concrete experiences and the content of the text and do not develop students' abstract thinking skills, students lose interest in learning English, and listening learning is neglected. By using multimedia in English listening teaching, students can experience English listening in a "real" environment where the audience may be foreigners. This dynamic environment for listening practice transforms vocabulary, sentences, and paragraphs into abstract materials; it also combines interesting video clips and audio recordings with the teaching content. The students improved their scores in the English listening part and also improved their overall English scores. The application of multimedia to English teaching greatly stimulates students' interest in learning English and gradually encourages them to participate in listening practice. This type of teaching helps the improvement of listening skills.

In the traditional English classroom, students repeat what the teacher reads or what the tape recorder plays. In both cases students are passive in the process of listening and speaking, and in most cases, they have no chance to listen and speak English in the classroom at all. Multimedia as an aid in English teaching can help students develop listening and speaking skills. Students can interact dynamically with what multimedia creates in the classroom. For example, students watch a dialog in a video, guess the meaning of the dialog based on the context in the video, and then the teacher asks the students to role-play the dialog to show if the students understand what they have heard.

Multimedia courseware can show students the background knowledge related to the listening material before the listening training, prompting students to build certain knowledge schemas before listening and to form new and more specific schemas in the subsequent process of listening to the information. Formal schema refers to the discourse knowledge of the text, including style, rhetoric, and the organization of the discourse. Before listening, teachers can familiarize students with the style of the material. When the process of missed listening occurs, the overall framework provided by the schema can help students reason and supplement the missed parts.

DATA AVAILABILITY

The figures used to support the findings of this study are included in the article.

CONFLICTS OF INTEREST

The author declares that no conflicts of interest.

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