Retraction

Retracted: A Survey of Multimedia-Assisted English Classroom Teaching Based on Statistical Analysis

Journal of Mathematics

Journal of Mathematics has retracted the article titled "A Survey of Multimedia-Assisted English Classroom Teaching Based on Statistical Analysis" [1] due to concerns that the peer review process has been compromised.

Following an investigation conducted by the Hindawi Research Integrity team [2], significant concerns were identified with the peer reviewers assigned to this article; the investigation has concluded that the peer review process was compromised. We therefore can no longer trust the peer review process, and the article is being retracted with the agreement of the Chief Editor.

References

[1] H. Wang, "A Survey of Multimedia-Assisted English Classroom Teaching Based on Statistical Analysis," *Journal of Mathematics*, vol. 2022, Article ID 4458478, 11 pages, 2022.

[2] L. Ferguson, "Advancing Research Integrity Collaboratively and with Vigour," 2022, https://www.hindawi.com/post/advancing-research-integrity-collaboratively-and-vigour/.

Research Article

A Survey of Multimedia-Assisted English Classroom Teaching Based on Statistical Analysis

Hui Wang ⓘ

Xinjiang Institute of Engineering, Ürümqi, China

Correspondence should be addressed to Hui Wang; wh28@xjie.edu.cn

With the promotion of information technology and education reform, multimedia classroom teaching, which has distinctive teaching characteristics, rich teaching resources, and vivid teaching forms, has been widely used in different classrooms, especially in English classrooms. However, there are still some problems in the application of multimedia-assisted instruction, and much work so far has focused more on language input (vocabulary, listening, and reading) of multimedia-assisted instruction, but there is limited empirical research on output (especially writing) of it. Therefore, from the perspective of statistical analysis, this empirical study investigates the effectiveness of multimedia-assisted English classroom teaching from the detailed aspects like preferred teaching activity, understanding key and difficult points, and overall performance and then formulates a multimedia writing teaching model in order to improve students' writing performance. The result shows that multimedia teaching does have superior advantages and the model enhances students' interest and scores in writing.

1. Introduction

The 21st century is an information age, and information technology makes the knowledge grow with an unprecedented trend, and the cycle of updating is also shorter and shorter [1]. Therefore, education, which is regarded as the significant means of knowledge dissemination, demands teachers to update knowledge faster and make students master the knowledge with higher efficiency. As there are some disadvantages associated with traditional method of teaching, the Chinese education system started thinking to reform their education policies. Therefore, under the premise of education reform and the change of teachers' teaching ideas, the traditional teaching methods are gradually changing to modern teaching methods [2]. Teachers realize that transferring a large amount of scientific knowledge and information to students quickly and effectively in a limited time has been the most important concern they face, even till today. With the development of information science and technology, the development of multimedia technology represented by computer has penetrated the field of education. The introduction of multimedia has

brought a new teaching mode for the diversity of classroom teaching. It not only broadens students' access to information and expands students' horizons but also enriches classroom activities and greatly improves students' interest in learning [3]. Moreover, multimedia-assisted teaching provides guidance, practice, and skill training for students' language learning, which acts as an indispensable auxiliary teaching tool.

Although multimedia has many advantages in classroom teaching, it is still in the process of practical application, and we have had problems of one kind or another. Due to the lack of hardware and software, teachers' own concepts and skills are backward, which is considered as one of the major problems associated with using multimedia in classroom teaching. Due to teachers lack of related theory, multimedia-assisted foreign language teaching is still in its infancy [4]. In addition, at the beginning of exploration, the implementation of multimedia-assisted English classroom teaching is found as imperfect; henceforth, teachers are not satisfied with the application of multimedia in class.

This empirical study aims at the problems of multimedia in today's English classroom. A teaching experiment with

college students as its participants will be conducted between an experimental group and a control group, and the effectiveness of multimedia-assisted English classroom teaching will be investigated and evaluated from different perspectives, and then a multimedia writing teaching model will be formulated in order to improve students' writing performance and develop other English skills, so that language learners will benefit more comprehensively from multimedia teaching and thus enhance the effective use of multimedia technology in English classroom.

The organizational structure of this paper is as follows. Section 1 mainly introduces the research background, research purpose, research significance, and the structure of this paper. The related work is discussed in Section 2. Section 3 analyses the characteristics and application mode of multimedia-assisted instruction. Based on the statistical analysis, Section 4 analyses the effectiveness of multimedia-assisted English classroom teaching. Section 5 illustrates the multimedia-assisted writing model and its effect, and Section 6 summarizes the whole paper.

2. Related Work

In recent years, there are many kinds of progress in the research of multimedia-assisted instruction. Many EFL research studies suggest that integration of multimedia can activate learning atmosphere, provide plenty of information, enhance motivation and interaction, and promote teaching and learning efficiency of language skills.

It is worth affirming that multimedia-assisted English teaching has activated our classroom, which is really helpful to English learning [5]. Multimedia-assisted college English teaching has changed the traditional classroom teaching mode which is based on teacher teaching [6]. With the rapid development of information technology and network resources, the emergence of foreign language learning tools like CD-ROM, courseware, and various Apps makes it possible for students to study independently on a single machine, and they can arrange their own learning according to their own time, which is not limited by class time and place, so that students can develop personalized learning and autonomous learning.

The combination of various kinds of media information can be realized by computers, which have the characteristics of high efficiency and interactivity. Multimedia can provide learners with a real language learning environment and multisensory input in learning. Besides, it can accommodate more diverse teaching information and train students' listening, speaking, reading, and writing skills in one class at the same time. It also enables teachers to extract teaching resources from all over the world at any time in classroom, which saves teachers' time and energy to collect information, and students can quickly obtain the latest knowledge and resources, thus improving classroom efficiency.

Multimedia teaching can realize the direct interaction between teachers, students, and computers without waiting. The process becomes more convenient, and feedback can be obtained immediately through multimedia, which can cultivate students to be active learners, rather than as passive

absorbers of information [7], while in class, teachers can freely choose multimedia teaching resources that are consistent with the teaching objectives and can adjust the teaching pace and content of the class at any time according to the feedback of students. This kind of efficient interaction can stimulate students' interest in learning.

The design standard of multimedia-assisted college English teaching courseware and the transformation of classroom teaching mode point out a clear way for teachers to correctly use multimedia-assisted English teaching. For example, some universities combine traditional teaching methods with multimedia teaching methods and create a network of "online learning + face-to-face tutoring", which stimulates students' interest in English learning and improves students' learning efficiency [8]. Moreover, multimedia-assisted English vocabulary teaching courseware also stimulates students' interest in English vocabulary learning and enhances the quality of vocabulary teaching [9]. In addition, research shows the display of multimedia glosses can reduce students' cognitive load and result in better performance in reading comprehension and vocabulary learning [10]. Relevant scholars believe that the combination of multimedia and English teaching can maximize the advantages of multimedia in image, sound, and animation, stimulate students' learning enthusiasm, and explore the auxiliary role of multimedia technology in teaching listening skills [11]. EFL learners' communicative competence can also get developed through the use of multimedia-assisted language instruction [12]. By watching, summarizing, and discussing YouTube online English learning resources, language learners can improve their writing fluency [13]. Also, practice has proved that the application of task-based multimedia-assisted translation teaching has significant advantages [14].

However, there is also a considerable amount of literature that discusses the challenges faced using multimedia in classroom teaching. The significant challenges include technical problems, accessibility of computers, sharing computer resources among teachers, student-teacher ratio in technological setting, outdated teaching practices, lack of advanced computer skills like designing graphics, adding animations, inserting cartoons, etc., lack of adding emotive values to the lecture, and lack of interaction between teachers and students [15, 16]. Some teachers lack adequate understanding of multimedia teaching, and they use PowerPoint presentations as an alternative to traditional way of teaching. Here, teachers copy textbook content to the slides with little explanation and expandation to the key points, which leads to knowledge overlapping and inefficiency. It was also found that student's role in such cases is passive [15, 17]. Teachers play the dominant role, and the development of students' creativity and critical thinking skills is restricted. These problems lead to serious educational issues where students slowly began to rely on computers or multimedia instead of teachers. Too much use of multimedia in classrooms distracts the attention of students as well. It was found that when using too many videos and images, students easily get distracted and lose their attention as well as presence of mind. The background effects can easily affect

the psychology of the students, and hence it will be not easy for them to choose to concentrate on the teaching content or on the videos [15, 16].

Multimedia-assisted teaching should be guided by advanced teaching theories. Nowadays, many related theories can be referred and applied, such as constructivist learning theory, Mayer's multimedia learning theory which provides an informative set of principles that can be used to create effective instructional message design, Paivio's dual coding theory, Baddeley's working memory model, and Sweller's cognitive load theory [18]. According to multimedia learning theory, teachers should use multiple simultaneous techniques such as combining narration and visuals in the presentation. Using multiple tools and techniques to deliver information will help the learners to relate themselves with the content. In fact, multimedia learning theory will help the teachers to communicate effectively with the learners. Several theories have discussed the effectiveness of using multimedia theory in classroom teaching, and one of the major contributions predominantly focuses on the use of various types of multimedia while teaching that attracts the attention of the learners and eventually impacts the effectiveness of learning [19].

To sum up, the advantages of multimedia-assisted language teaching outweigh its disadvantages, and the benefits of multimedia-assisted English teaching should be brought into full play, and problems occurred during teaching practice need to be solved. As many research studies have focused on language input (vocabulary, listening, and reading) of multimedia-assisted instruction, but limited empirical research on output (especially writing) of it, this study first investigates the effectiveness of multimedia teaching mode and then formulates a multimedia-assisted writing teaching model that aims to improve students' writing performance and develop with other language skills. The solution of writing issues will enable students to benefit more comprehensively from multimedia teaching and to further improve the advantages of multimedia teaching.

3. Multimedia-Assisted Instruction

The so-called multimedia-assisted teaching is to combine graphics, images, sound, text, animation, and other media organically through computers, video display platforms, projectors, and other equipment to show the teaching content to the students in an intuitive, vivid and beautiful way, so as to enhance teaching effectiveness [20]. Because multimedia teaching is mainly composed of computer and video media, with the development of computer technology and integration technology, multimedia teaching mainly refers to computer integrated multimedia teaching, that is, using computer to gather a variety of media to realize the combination of various media. In the teaching process, teachers follow the teaching plan which is made according to the teaching objects, objectives, and content, select the appropriate teaching media, directly display the teaching content, and interact with students in real time, to achieve the effectiveness of multimedia display and real-time explanation. The composition of multimedia determines that

multimedia has the following characteristics in teaching: intuition, interaction, integration, controllability, nonlinearity, and editability. Also, multimedia teaching can be roughly divided into three categories: teaching mode based on a single machine; teaching mode based on LAN; and teaching mode based on the Internet (Figure 1).

3.1. Multimedia Teaching System. Multimedia teaching system has access to massive technology, and each has powerful functions. For example, display technology, where the technology investment cost and energy consumption are relatively low, can get high-definition pictures and images, to provide users with accurate port connection [21]. Users can easily get connected, and the connection does not need to be verified, so they can log in at any time. Software technology can make complex software be used in a wide range, and its use repeatability is relatively strong. Wireless technology, such as broadband CDMA technology and infrared technology, can provide efficient broadband to users. In addition, we must mention virtual reality, which is based on a kind of virtual space, to realize the continuous expansion of the picture, giving people a sense of immersive experience, and it has been proved to be very effective in terms of ease of learning [22]. In fact, it has already been used in language learning and welcomed by users. Media application platform gives users a broad space, and it promotes the continuous development of science and technology and integration of industry technology, making the technology market become prosperous [23]. With the improvement of technology, people enjoy telemedicine, active image, high-definition television, distance teaching, interactive voice, and other services. The powerful functions enrich people's lives as well as education field.

Multimedia teaching system combines these technologies together. Usually, the main hardware of multimedia integrated classroom is composed of a computer, a video display platform, a projector, an electric screen, and a variety of playback equipment (such as video recorder, VCD or DVD player, power amplifier, etc.), which is controlled by console and computer, so as to form a scientific, coordinated, and efficient teaching demonstration system (as shown in Figure 2).

3.2. Multimedia Teaching Mode. At present, the application of multimedia technology in college English teaching mainly focuses on using online platforms and their resources. Compared with traditional classroom's "chalk + blackboard" environment, multimedia integrated classroom enables teachers prepare and display teaching content in time, helping students fully understand the corresponding teaching objectives, key and difficult points, and teaching process and saving valuable classroom time. In addition, teachers can also provide students with more information input and more opportunities to practice, so as to improve the efficiency of teaching.

Based on related theories and previous research findings, this experiment integrates and balances the teaching of five English language skills (listening, speaking, reading, writing,
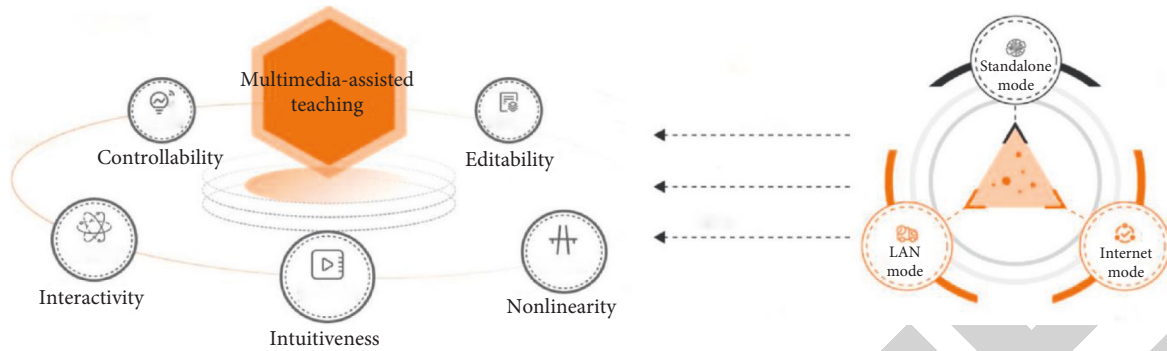
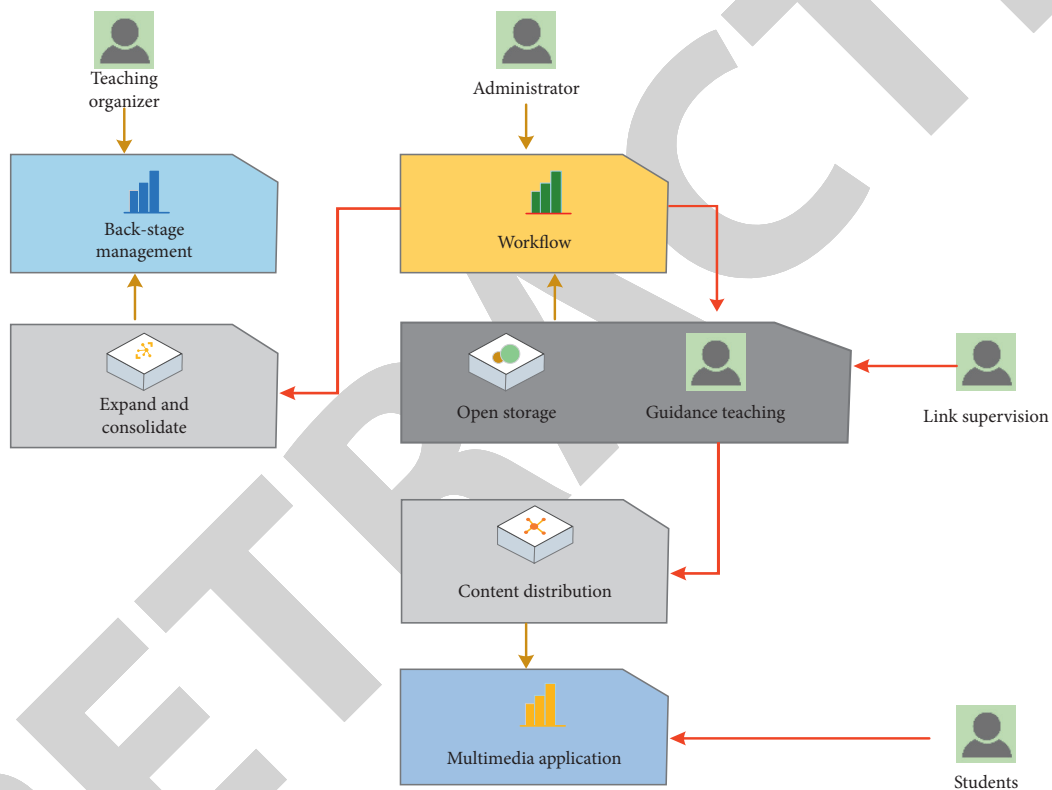Figure 1: Characteristics and modes of multimedia-assisted teaching.

Figure 2: Multimedia teaching system.

and translating) and tries to make full use of multimedia-assisted teaching. Figure 3 shows a general multimedia teaching mode used in this teaching experiment. From the figure, it can be inferred that the database mainly includes teaching content in the form of audio, video, pictures, PPT, texts, and so on, interactive platform, digital library, and online dictionary. Teachers and students use equipment such as laptops, mobile phones, and classroom terminal to access the data transferred through the Internet, intranet, or mobile network. Then, teaching and learning interaction-related activities include lecturing, individual and group learning, students' presentation, etc. In this way, multimedia is used in classroom teaching, and each part of the multimedia plays a crucial role in applying the multimedia technology in and beyond classrooms as proposed in Figure 3.

Under the guidance of constructivist learning theory, college integrated English course should be student-centered in order to achieve certain teaching objectives. Teachers, as the organizers of teaching, should actively create learning situations for students that are conducive to activating their original knowledge and experience, provide corresponding counselling and practice opportunities, organize and participate in the cooperation and interactive learning among students, and evaluate the learning effect in time, so as to improve teaching [2]. As the main body of meaning construction, students should give full play to their subjective initiative, actively participate in the whole process of classroom learning with the help of teachers, complete the corresponding tasks of learning activities, carry out self-test, consolidate and improve the construction of knowledge, and improve the learning effect and efficiency [24]. Also, the
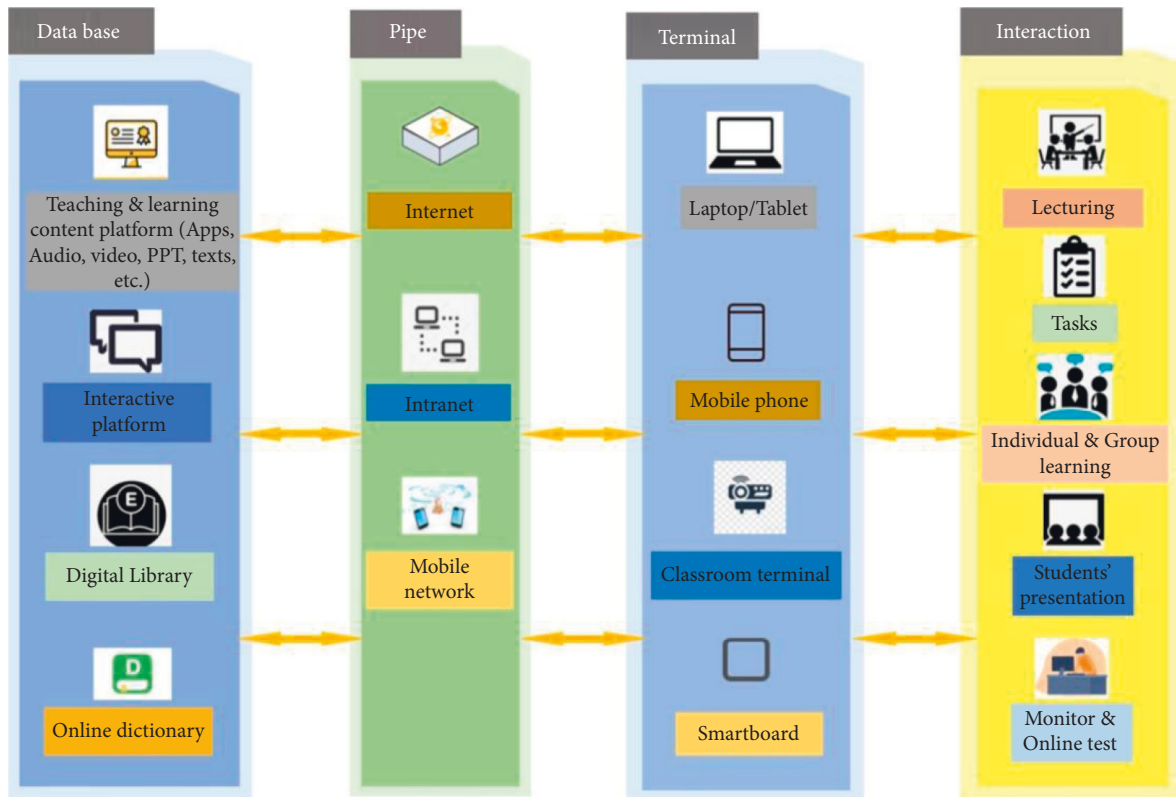
Figure 3: Multimedia teaching mode.

multimedia comprehensive classroom runs through the whole process of teaching experiment. The important role of multimedia-assisted instruction is mainly reflected in the clearer display and presentation of a large number of background information and language exercises, which is convenient for students to build and consolidate their knowledge and improve the efficiency of learning.

4. Evaluation of Multimedia-Assisted English Teaching

The participants of the teaching experiment were 90 first-year undergraduates of non-English majors from a western Chinese university, who were selected and divided into two groups (45 students for each) according to their English scores of National College Entrance Examination and Pre-test. Chinese was their L1 and English was their foreign language. Participants in both experimental group (multimedia methods) and control group (traditional mode, where textbooks, cards, pictures, and PowerPoint slides are often used) have the similar English proficiency (intermediate level). The experiment was conducted over a period of one academic year, and each lesson (90 minutes) was given twice per week and all participants from the two classes were taught by the same English teacher with the same textbook New Progressive College English (Books 1 and 2). In this study, the performance of two groups of participants was measured after the experiment, and questionnaire survey and examination results were employed to collect information to measure the effectiveness of multimedia-assisted

English teaching. Participants' subjective and objective evaluation is shown below.

4.1. Students' Feedback on Multimedia-Assisted English Teaching. At the end of the first semester, the author conducted a questionnaire survey of students' feedback on multimedia-assisted English teaching, and it covers many aspects which serve as the evaluation of the teaching mode. The questionnaire consists of two parts: the first part consists of 20 multiple-choice questions, each of which has five options of 5-point Likert scale. The second part is question and answer, which is open-ended and consists of five subquestions.

4.1.1. Learning Interest and Efficiency. It can be seen from Figure 4(a) that 8.7% (2% very inconsistent and 6.7% inconsistent) students think that multimedia-assisted teaching does not enhance their interest in English learning; 13% of the students think that the multimedia plays a general role in raising their interest in learning, while 45% of the students consider that their interest in learning English has been improved, and 33.3% of the students believe that they have become passionate about learning English. As it can be seen from Figure 4(b), 10.9% (2% very inconsistent and 8.9% inconsistent) of the students think that multimedia-assisted teaching does not improve their English learning efficiency; 18% of the students think it sometimes improve their learning efficiency, while 42.2% of the students believe they have greater English learning efficiency, and 28.9% of the
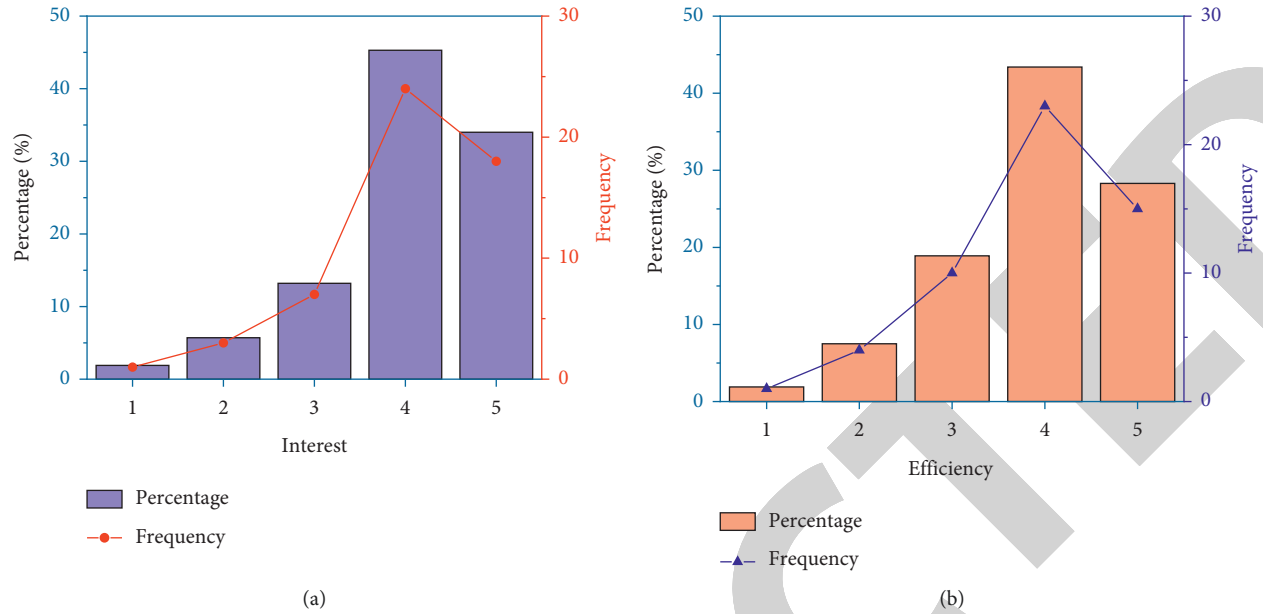
FIGURE 4: Percentage of learning interest and efficiency after multimedia-assisted teaching. (a) Interest. (b) Efficiency.

students think that their English learning efficiency has been advanced to a large extent.

4.1.2. Understanding Key Points and Having Positive Thinking.
It can be seen from Figure 5(a) that only 4% (2% very inconsistent and 2% inconsistent) think that multimedia-assisted teaching does not help them understand key and difficult points in English learning; 15.5% of the students think that the multimedia mode can sometimes help their understanding; 45% of the students believe it helps them better grasp the key knowledge, and 35.5% of the students think that their understanding of key and difficult points has been greatly improved. It can be seen from Figure 5(b) that 6.5% of the students think that multimedia-assisted teaching does not inspire their positive thinking in English learning, and the students who think it sometimes inspires their positive thinking occupy 11.1%. However, 49% of the students believe that the teaching mode generally stimulates their thinking, and 33.3% of the students think that their positive thinking in English learning has been fully inspired.

4.1.3. Preferred Teaching Activity.
The questionnaire related to this part has options ranging from Strongly Agree, Agree, Uncertain, Disagree to Strongly Disagree, and when it comes to answer the question: "Which is your favorite teaching activity?" The result shows that "open-ended task" gets the highest rank.

Open-end tasks generally have a wide range of appropriate responses, take longer time to complete, evaluate the knowledge and skills of the learners, include problem-solving strategies, allow learners to think critically, and demonstrate higher levels of understanding by providing opportunities. It also engages learners to discuss their opinions and ideas in a creative manner. Multimedia

learning provides seamless opportunities for students to perform the open-ended tasks in their own original and unique manner using different multimedia technologies.

It can be seen from the survey results in Figure 6 that the vast majority of students believe that the implementation of open-ended tasks in multimedia environment has many merits. A total of 71.1% of the students think that the implementation of open-ended tasks expands their vocabulary. 75.5% say it improves reading ability, and 57.8% think it also enlarges their reading scope. In the process of preparing their works, students collect raw materials by browsing foreign websites and English books to enrich their ideas and expressions, thus virtually increasing the amount of vocabulary and reading range. The results show that 82.2% and 73.3% of the students think their expressing enthusiasm and learning enthusiasm have been stimulated, respectively, as the tasks enhance their self-confidence, while 20% and 17.8% of the students are uncertain about their reading scope and spoken English proficiency, respectively, which may be due to the reason that many students' reading range is limited by the text topic of the textbook, and some students just read aloud the prepared manuscripts, which cannot be seen as effective face-to-face communication. Meanwhile, some students' pronunciation is not accurate and their vocabulary is limited, which may cause listeners to lose interests.

4.1.4. Autonomous Learning.
The questionnaire also examines whether multimedia teaching promotes learners' autonomous learning ability. Autonomy is an ability responsible for one's own learning. When learners have the ability of autonomous learning, it means that learners themselves can determine the learning objectives, contents, materials and methods, time, place, and progress of learning and evaluate learning. The questionnaire designs
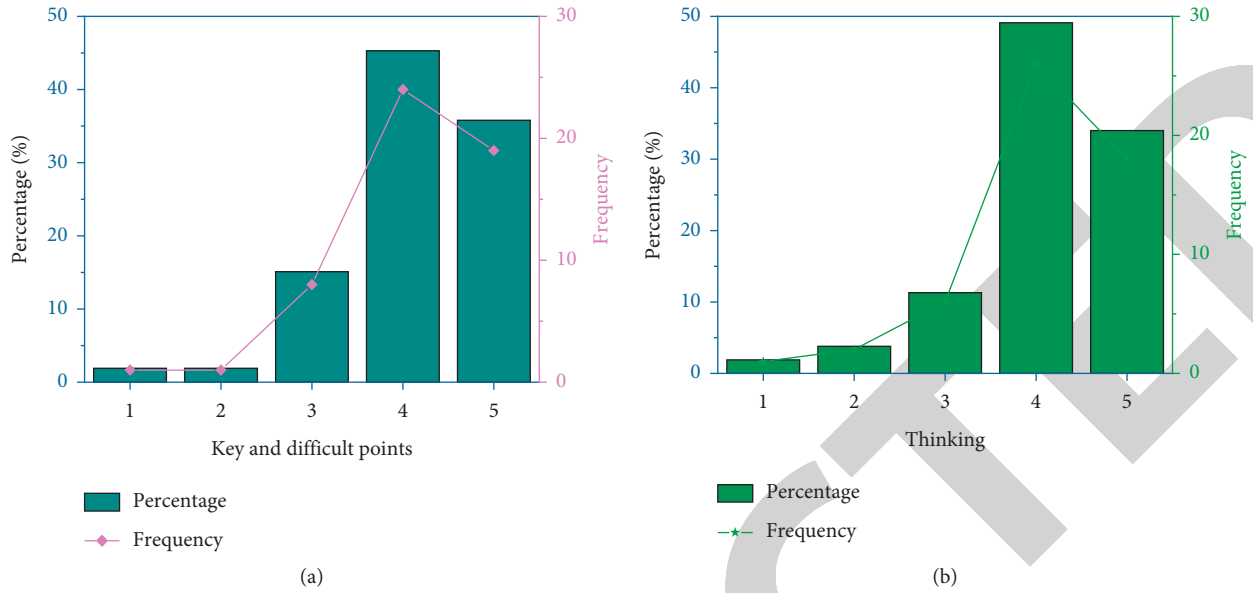
Figure 5: Percentage of understanding key and difficult points and having positive thinking after multimedia-assisted teaching. (a) Key and difficult points. (b) Thinking.
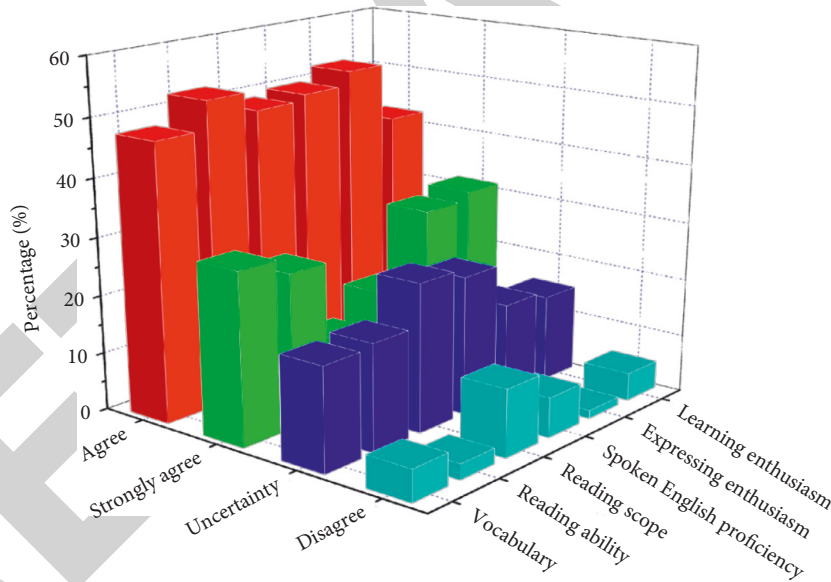

Figure 6: Learners' evaluation of the effectiveness of open-ended tasks.

questions from the perspectives of learning attitude, learning contents, materials and methods, and reflection on learning process.

According to the relevant statistics in Figure 7, 75.6% of the students like to participate in open activities. 80% of the students think that they have freedom to choose learning materials and 71.1% think they can process the selected materials and learn in their own way. 77.8% of the students believe that multimedia teaching enhances their study ability. In the process of completing tasks, students have a certain decision-making power and can selectively absorb and reconstruct information in their own way. Overall, most students think that multimedia teaching can promote

the development of autonomous learning ability. However, 25.3% of the students are uncertain about whether to reflect and modify their works, and 12% of them do not agree to reflect and modify their works. It can be seen that students fail to realize the importance of reflection in promoting autonomous learning. In the answer of open-ended questions, students generally say that due to busy homework and limited time, they cannot keep improving their works all the time. Some students think that they have spent a lot of time and energy to prepare the activity before class. Once the unit teaching is over, they will not have the motivation to modify it, so they ignore the continuous learning in the reflection stage.
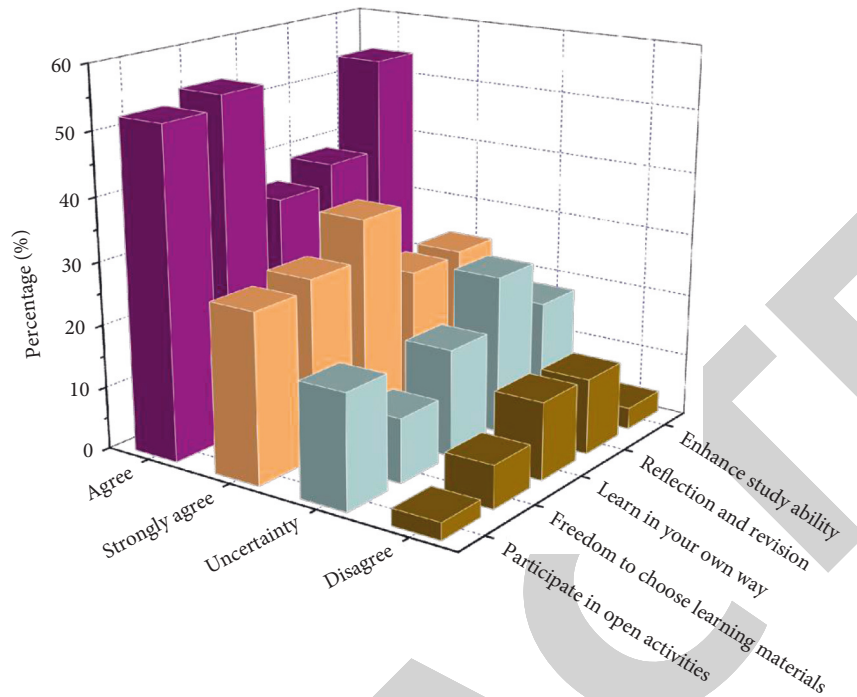
Figure 7: Evaluation of the promotion of autonomous learning.

4.2. Students' Performance after Multimedia-Assisted English Teaching. In order to compare the performance differences between traditional teaching and multimedia-assisted teaching, this paper examines the final examination results of 90 freshmen at the end of the first semester. The final exam is adapted from a past exam paper of CET-4 (College English Test-Band 4, a large-scale English exam in China) and is divided into five parts: listening, vocabulary and grammar, reading, writing, and translation.

The distribution of students' scores in traditional teaching environment is wide and scattered, while the distribution of that in multimedia teaching environment is relatively concentrated. After obtaining the candidates' scores, the paper makes a comparison of various achievements, as shown in Figure 8.

From Figure 8, it can be inferred that multimedia-assisted English teaching mode has significant advantages, among which the average difference of listening and reading is the largest (2.5 and 2, respectively). From the average of the total score, the difference between the two is 6.6. Although the average total score of traditional teaching is lower than that of multimedia-assisted English teaching mode, there is no significant difference between the items of writing and translation, which may be due to many possible reasons, including L1 influence in the process of EFL writing, limited time, inappropriate teaching model, and so forth. How to improve the effect of multimedia teaching in writing and translation is a problem that needs to be focused. As writing is considered to have a close relationship with students' academic performance and research, a new experimental writing teaching model was sketched and conducted in the second semester.

5. Modified Writing Teaching Model and Its Effect

Compared with traditional writing teaching, where the teacher often provides writing samples to students, assigns writing tasks, and checks them, the multimedia-assisted writing teaching model focused more on providing learning resources and using online writing correction websites and the teacher to help students correct their writing errors in the first semester. However, much work can be done to make full use of multimedia-assisted instruction to improve writing performance.

5.1. Modified Writing Teaching Model. Multimedia and multimodal have similar definitions. While "multimedia" is used more frequently in public/industry contexts and it emphasizes the production of a deliverable text, "multimodal" is preferred in the field of composition and rhetoric, and it focuses on design and process [25]. Multimodal composing is influenced by social semiotics and uses a variety of social symbols and multiple modes to express meaning, including but not limited to text mode, visual mode, audio mode, body mode, and space mode. Researchers like G. Kress, T. Van Leeuwen, and the New London Group all believe that all texts are expressed or embodied by linguistic, visual, or spatial modes. In other words, in order to express meaning, the authors usually use multiple modal resources to design and demonstrate their way of thinking [26–28]. In today's intelligent and digital age, text-centric communication has been replaced by image-centric and other modal-centric methods. This means that although language is regarded as the primary channel of
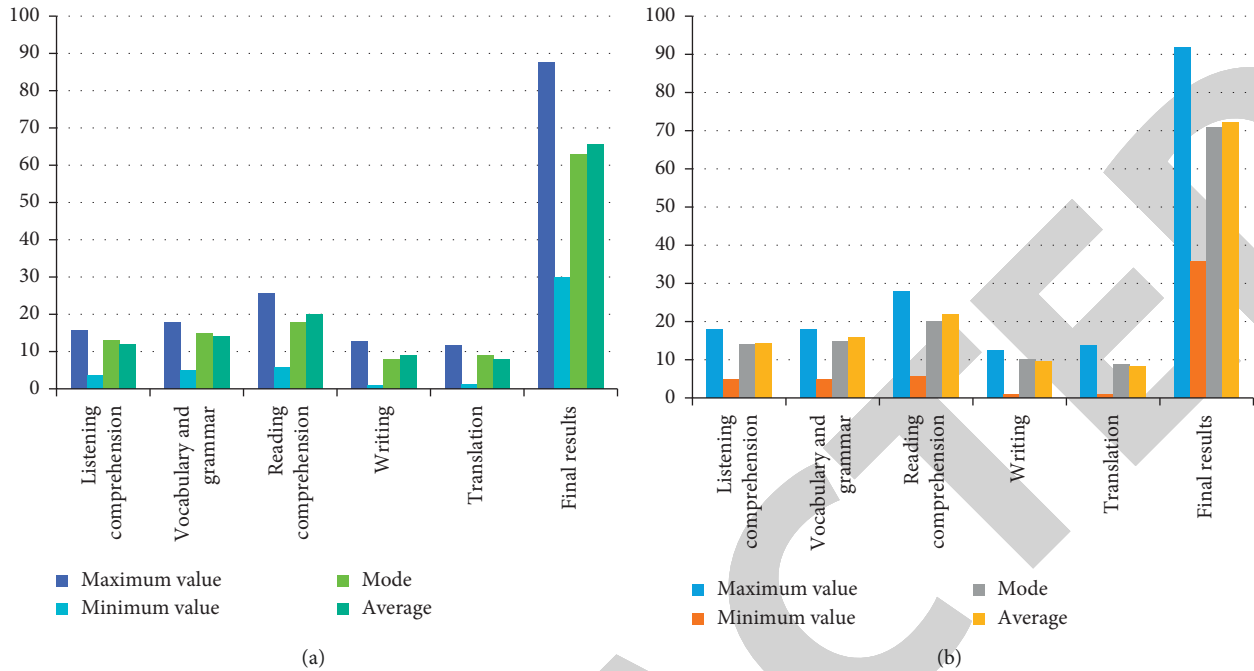
Figure 8: Comparison of English test results. (a) Traditional teaching. (b) Multimedia-assisted teaching.

communication, other modes such as body language, images, and sound can also express important meanings [29]. In this sense, the authors can use multiple modal resources when creating texts and express meaning or communicate with readers through multiple modal resources. Multimodal text creation is an extension of traditional writing, and it also enables writing to develop in a more diversified and multimodal direction.

Therefore, based on multimodal composing theory and findings of the teaching experiment in the first semester, like students' preference on open-ended tasks, their expressing enthusiasm and understanding of key and difficult points have been improved in multimedia environment, and a revised writing teaching model (Figure 9(b)) was constructed, which added discussion section before writing and summary writing section after learning each text. Other major differences lie in a clear closed-learning loop, multiple modification, and teacher guiding practice which aims at improving students' writing accuracy instead of too much reliance on students' autonomous learning. The model was hoped to better satisfy students' learning need, suit their major, and improve their writing performance.

5.2. Students' Performance after Multimedia-Assisted EFL Writing. According to questionnaire survey, 75.6% students think teacher guiding practice, especially imitating sentence patterns, is their favorite writing activity, for it gives them a sense of security that at least one-third or a half of the sentence is correct, which indicates that they value accuracy. For instance, after watching the video clips and reading the novel *Pride and Prejudice* written by Jane Austen, students chose the first sentence of the novel as a good sentence pattern—"*It is a*

truth universally acknowledged that a single man in possession of a good fortune must be in want of a wife" [30]. Then, the teacher guides students to imitate the sentence pattern to write their own sentences relating to the writing topic—How to conserve water? Here are the examples of students' writing: "*It is a truth universally acknowledged that* dry areas must be in want of water" and "*It is a truth universally acknowledged that* desalination of seawater is very expensive." They are more than happy to have the ability to use the same sentence patterns in various contexts properly.

Furthermore, 82% of students like multimodal writing and believe that it arouses their interest in writing for it helps learners relate themselves with the writing content and integrates English learning, their major, creativity, online resources, autonomous learning, and so forth in a whole package. Students use various software programs (some related to their majors) to design pictures, headings, and instructions, take notes on a cognitive map, type in text, check their writing, and record and send their voices narrating what they had written. Figure 10 shows students' multimodal writing examples in response to the writing task—design a useful machine that helps to protect the environment.

In addition, all the writings of the final examination of the second semester were evaluated by two teachers within two rounds with the four scoring criteria of IELTS: response to the task, grammatical range and accuracy, lexical resource, and coherence and cohesion. From the average writing score, the difference between the two is 1 (total of 9 points), which showed a relatively significant improvement in their writing within multimedia-assisted model. Also, the students reported that they would like to continue using this teaching method in future.
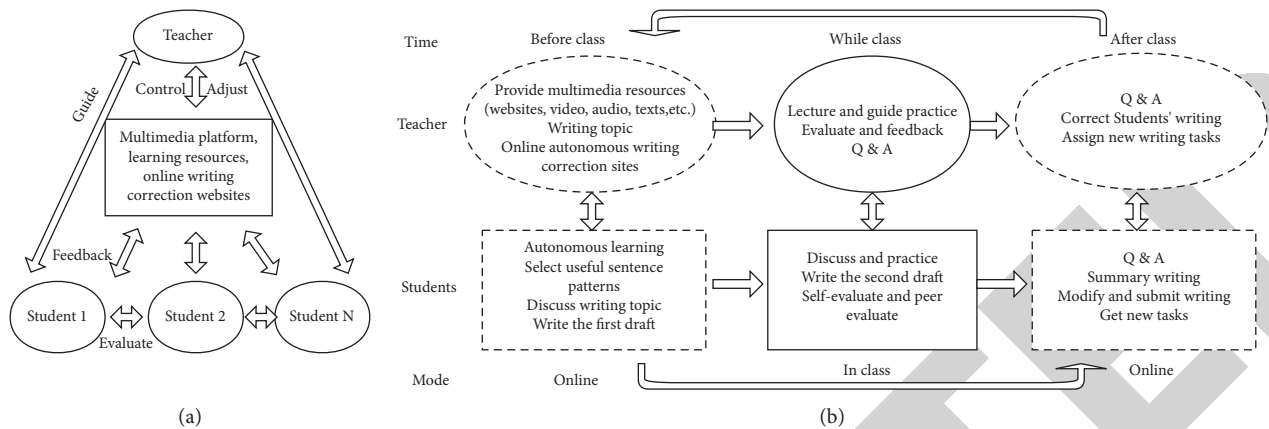
Figure 9: Multimedia writing teaching model. (a) Writing model in the first semester. (b) Modified writing model in the second semester.
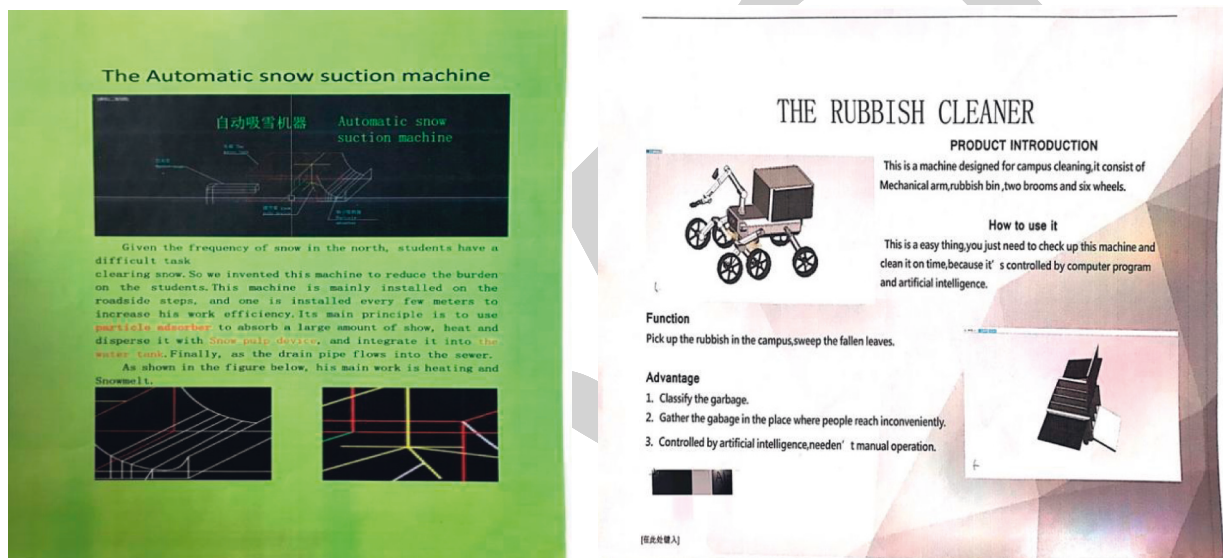

Figure 10: Students' writing examples (majored in Mechanical Design).

6. Conclusion

This paper evaluates multimedia-assisted English teaching from different aspects, and it proves that multimedia-assisted language learning provides authentic learning resources, cultivates learner motivation, complements traditional curriculum, and increases better learning outcomes. Furthermore, it is also found that multimedia teaching can significantly improve students' listening and reading ability, which makes the total English score of multimedia teaching group obviously higher than that of traditional teaching group. However, there is no significant difference between multimedia teaching and traditional teaching methods in writing and translation after one semester's experiment, but the study continues to adjust and apply a new writing teaching model in the second semester, which later shows that it better enhances students interest in writing and further improves the advantages of multimedia teaching. Due to time limitations, the study only involved overall writing scores rather than detailed comparison of vocabulary, sentence length, type of errors, etc. between the two groups of writing, which may

be examined in detail in the future. Multimedia classroom teaching is a complex teaching process. The development and evaluation of all aspects of multimedia classroom teaching needs long-term research and practice. We should clearly realize that no matter how advanced multimedia technology is and how helpful it is to English teaching, it is only a teaching aid. To achieve real success in English classroom teaching, we must give full play to teachers' leading role and students' subjectivity. It is believed that through our efforts, multimedia-assisted English teaching will promote the steady development of English teaching towards a better direction.

Data Availability

The data and models generated or used during the study are included within the article.

Conflicts of Interest

The author declares that there are no conflicts of interest.

References

[1] L. Hong-Mei, "Research on independent learning ability based on the network multimedia vocational college English teaching model," *Agro Food Industry Hi-Tech*, vol. 28, no. 1, pp. 3494–3496, 2017.

[2] F. Guo and X. R. Wu, "The application of multimedia technology in college English reading teaching---A survey based on language learning strategies," *International Journal of English Language Teaching*, vol. 6, no. 2, pp. 27–30, 2019.

[3] L. Zhang, "Effectiveness analysis of flipped classroom on business English teaching under multimedia network environment," *International Technology Management*, vol. 12, no. 5, pp. 16–18, 2015.

[4] W. H. Huang, "Study on college English teaching mode multimedia assisted based on computer platform," *International Journal of Multimedia and Ubiquitous Engineering*, vol. 11, no. 7, pp. 351–360, 2016.

[5] Z. Shi, "Research of English teaching and learning methods based on constructivism theory assisted by multimedia," *Technical Bulletin*, vol. 55, no. 17, pp. 724–731, 2017.

[6] B. Liu, "Multimedia classroom and innovation of English teaching model based on web-based learning platform," *Revest de la Faulted de Ingenerate*, vol. 32, no. 12, pp. 1000–1006, 2017.

[7] T. Guo and Q. J. Jia, "Research on the impact of multimedia computer-based English teaching in high school," *International Journal of Emerging Technologies in Learning*, vol. 11, no. 8, pp. 33–39, 2016.

[8] M. Zhang, Y. Liu, and X. Wang, "Research on the teaching of English subjunctive mood based on mathematical analysis and multimedia," *International Journal for Engineering Modelling*, vol. 31, no. 1, pp. 337–343, 2018.

[9] N. Yue, "Computer multimedia assisted English vocabulary teaching courseware," *International Journal of Emerging Technologies in Learning (iJET)*, vol. 12, no. 12, pp. 67–78, 2017.

[10] E. Türk and G. Erçetin, "Effects of interactive versus simultaneous display of multimedia glosses on L2 reading comprehension and incidental vocabulary learning," *Computer Assisted Language Learning*, vol. 27, no. 1, pp. 1–25, 2014.

[11] A. T. Ampa, "The implementation of interactive multimedia learning materials in teaching listening skills," *English Language Teaching*, vol. 8, no. 12, pp. 56–62, 2015.

[12] K. O. Jeong, "Developing EFL learners' communicative competence through multimedia-assisted language learning," *Journal of Theoretical and Applied Information Technology*, vol. 96, no. 5, pp. 1367–1376, 2018.

[13] A. Alobaid, "Smart multimedia learning of ICT: role and impact on language learners' writing fluency–YouTube online English learning resources as an example," *Smart Learning Environments*, vol. 7, no. 24, pp. 1–30, 2020.

[14] Y. Shu, "Experimental data analysis of college English teaching based on computer multimedia technology," *Computer-Aided Design and Applications*, vol. 17, no. S2, pp. 46–56, 2020.

[15] J. Lu and N. B. Yahaya, "The problems and countermeasures of applying multimedia technology in college English teaching," *International Journal of Engineering and Advanced Technology*, vol. 8, no. 5C, pp. 1512–1516, 2019.

[16] M. H. Sarowardy and D. P. Halder, "The issues and challenges of using multimedia at a district level, specialized girls' college in Bangladesh," *Creative Education*, vol. 10, no. 7, pp. 1507–1524, 2019.

[17] R. Deutscher, "Challenges using multimedia integrated within a science curriculum using a classroom-centered design approach," 2009, http://citeseerx.ist.psu.edu/viewdoc/download.

[18] R. E. Mayer and R. Moreno, "Nine ways to reduce cognitive load in multimedia learning," *Educational Psychologist*, vol. 38, no. 1, pp. 43–52, 2003.

[19] M. Ramlatchan, "Chapter 3: Multimedia learning theory and instructional message design," *Instructional Message Design*, vol. 10, 2019.

[20] J. Yin and Y. Na, "Path analysis of college English teaching ability improvement based on MOOC and multimedia systems," *Technical Bulletin*, vol. 55, no. 8, pp. 427–433, 2017.

[21] X. Zhao and Y. Liu, "Research on the design and optimization of English situational teaching assisted by multimedia network platform," *Revest de la Faulted de Ingenerate*, vol. 32, no. 9, pp. 642–648, 2017.

[22] M. Nooriafshar, R. Williams, and T. N. Maraseni, "The use of virtual reality in education," in *Proceedings of the 7th American Society of Business and Behavioral Sciences International Conference*, Cairns, Australia, August 2004.

[23] K. H. Chen and C. Q. Pan, "On multimedia-assisted english vocabulary teaching for Chinese junior middle school english learners from the perspective of situational teaching method," *Ira International Journal of Education and Multidisciplinary Studies*, vol. 14, no. 3, pp. 80–83, 2019.

[24] Z. Kalmamatova, A. Shamurzaev, R. Ysmailova et al., "Graphic organizers as effective methods in teaching classroom English," *Open Journal of Modern Linguistics*, vol. 10, no. 5, pp. 459–467, 2020.

[25] C. Lauer, "Contending with terms: "Multimodal" and "Multimedia" in the academic and public spheres," *Computers and Composition*, vol. 26, no. 4, pp. 225–239, 2009.

[26] G. Kress and T. Van Leeuwen, *Multimodal Discourse: The Modes and Media of Contemporary Communication*, Arnold, London, UK, 2001.

[27] C. B. Cazden, "A pedagogy of multiliteracies: designing social futures," *Harvard Educational Review*, vol. 66, no. 1, pp. 60–93, 1996.

[28] C. Jewitt and G. Kress, *Multimodal Literacy*, Peter Lang, New York, NY, USA, 2003.

[29] K. L. O'Halloran, "Multimodal discourse analysis," *Companion to Discourse Analysis*, Continuum, London, UK, 2011.

[30] J. Austen, *Pride and Prejudice*, Tianjin People's Publishing House, Tianjin, China, 2015.