

Retraction

Retracted: Teaching of College English Writing from the Perspective of Multimedia Education

Wireless Communications and Mobile Computing

Received 15 November 2022; Accepted 15 November 2022; Published 25 November 2022

Copyright © 2022 Wireless Communications and Mobile Computing. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Wireless Communications and Mobile Computing has retracted the article titled “Teaching of College English Writing from the Perspective of Multimedia Education” [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] X. Cao, “Teaching of college English writing from the perspective of multimedia education,” *Wireless Communications and Mobile Computing*, vol. 2022, Article ID 6523230, 9 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

Teaching of College English Writing from the Perspective of Multimedia Education

Xiangying Cao ^{1,2}

¹Department of Foreign Languages, Nanchang Institute of Technology, Nanchang, 330044 Jiangxi, China

²College of Education, Arts and Sciences, Lyceum of the Philippines University Batangas, Capitol Site, Batangas City 4200, Philippines

Correspondence should be addressed to Xiangying Cao; xiangyingcao@lpubatangas.edu.ph

Received 5 March 2022; Accepted 15 April 2022; Published 20 May 2022

Academic Editor: Rashid A Saeed

Copyright © 2022 Xiangying Cao. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

The rapid development of science and technology, the rapid updating of computer technology, the constant networking, and computerisation of society are ushering in a new era in which computer technology and various media are used to process and disseminate information. Multimedia technology has also been mentioned and developed in the field of education. Its intervention has had a significant impact on education, leading to a renewed conception of educators, educational methods, and forms of learning. This paper is based on educational theory, educational planning theory, and educational psychology theory, starting from the combination of network multimedia and college English writing instruction through detailed demand analysis and system design, fully using modern information technology to build a multimedia network learning platform of blended college English writing instruction. This paper examines the application of multimedia technology in blended learning college English writing. Based on the reading and collecting of a large number of materials, it combines the long-term experience of teaching practice, the concept of multimedia, characteristics, application status, and development trends of multimedia technology; in-depth analysis of the current situation and problems faced by blended learning English writing in college summarizes the application of multimedia curriculum in teaching practice and feedback on the use of multimedia curriculum in teaching English writing in college. The experiments showed that the P value of students' attitude toward English writing and multimedia teaching method is less than 0.05, which showed that the multimedia teaching method could improve students' self-discovery ability and enhance the learning effect; the repetition of multimedia teaching material conforms to the memory rules and effectively helps students to remember what they learn repeatedly.

1. Introduction

Writing feedback is one of the most important steps in learning English writing. Discovering a more effective form of feedback is of great practical importance to improve college students' writing skills and increase their interest in English. Although many college English teachers are constantly trying different methods of writing, the results are not perfect, so writing has become a difficult part of college English teaching. Many factors contribute to these results, and feedback writing is one of them. Multimedia technology plays a very important role in supporting the teaching of

English writing. It has indeed brought a lot of vitality and liveliness to the teaching and to some extent increased the students' enthusiasm for learning, but at the same time, there are also various shortcomings. In particular, in the area of teaching English writing in colleges and universities, there is less participation. These deficiencies will have adverse effects on the efficiency of teaching. Therefore, this study adopts a combination of various teaching methods to improve the university English writing ability [1, 2].

Schank et al. noted that students attach great importance to teacher feedback when writing in English, but the language of teacher feedback on students' essays is often

ambiguous, which to some extent affects students' comprehension of teacher feedback information [3]. Rabiei et al. believe that the peer feedback process is a collaborative learning process for students. In this process, students have more opportunities to communicate, which can improve mutual feelings and understanding, reduce students' anxiety, and improve writing skills [4]. Kim et al. believe that peer feedback can not only reduce students' writing anxiety and increase students' interest in writing but also develop students' ability to analyze and solve problems and improve error correction and writing skills [5].

Hwang and Park pointed out that peer feedback gives students more opportunities for independent learning, while feedback from the teacher is easier for students to absorb [6]. Ma et al. conducted a study on the effectiveness of mixed feedback in teaching writing, and the results showed that students confirm the positive effects of mixed feedback and this method of feedback can improve English writing skills [7]. A study by Bijani et al. showed that peer feedback can effectively reduce students' writing anxiety and improve students' writing motivation and overall editing skills [8].

Most experts, scholars, and teachers analyze the current situation and existing problems in teaching English writing. Most of them conduct theoretical analysis and then put forward their views and solutions to the problems based on the theory.

This study is not limited to theoretical analysis of writing instruction but is a bold attempt at practical work. With the help of flash multimedia software, a teaching kit for teaching writing in English, suitable for non-English speaking college and university students, has been developed. This paper analyzes the use of multimedia courseware to promote teaching through the questionnaires conducted by students and the tracking of their academic performance and examines its role in improving teaching effects and enhancing students' learning enthusiasm.

2. Multimedia Education Teaching

2.1. Network Multimedia Teaching

2.1.1. Online Learning. The rapid development of modern educational technology has provided the necessary technical support tools to reform learning methods [9–12]. In a broader sense, online teaching refers to the use of online technology as a new learning environment that fully integrates learner domination and explores organic learning factors as the primary method of teaching [13–15].

2.1.2. Characteristics of Online Multimedia Learning. Online teaching overcomes the disadvantages of traditional teaching in that it is difficult to achieve multilevel learning objectives. It can define the starting point and the learning objective according to the real situation of the students. In terms of overall human development, online learning also offers many realistic possibilities. It contains not only content that teachers teach in the learning process but also content that teachers find difficult to express verbally. It also brings rich

and colourful life phenomena into the learning process. It contributes not only to students' learning but also to their development [16, 17].

2.2. Related Teaching Concepts

2.2.1. Output-Oriented Approach. The output-oriented method advocates the output-driven hypothesis for the purpose of output; the input facilitating hypothesis believes that in the process of students' learning language, appropriate input learning materials can promote language output; according to the actual needs of students, selection is conducive to the production; it is the connotation of the selective learning hypothesis to use the learning materials to learn that can save time and achieve more satisfactory learning results; the evaluation-promoting hypothesis advocates that under the guidance of teachers, students conduct self-evaluation among themselves and cooperative evaluation between teachers and students aiming to jointly deepen students' learning [18, 19].

2.2.2. Blended Teaching. Due to problems such as immature technology and unmanned supervision, satisfactory results have not been achieved. So people began to try to use blended teaching, using different learning theories and different technical means to apply to actual teaching through both online and offline methods. The definition of blended teaching can also be summarized into two types: broad sense and narrow sense. Broadly speaking, blended teaching is the mixed use of multiple learning theories and teaching modes to optimize teaching effects. In a narrow sense, blended teaching is a combination of online learning and classroom face-to-face teaching [20, 21]. In order to meet the requirements of different learning theories, different learning methods, and different learning environments and learning resources, a variety of learning theories are needed to guide mixed teaching. Therefore, mixed teaching is not based on a specific theory, but a variety of learning theories' comprehensive construction. Moreover, according to the different problems faced by education in different periods, learning theories that are more closely related to the current teaching goals should be selected to achieve a more ideal teaching effect.

2.2.3. Output-Oriented Approach Based on Blended Teaching. In the preclass, in-class, and after-class phases, the teacher's teaching activities are required and the students' learning process is also explained in detail. The preclass stage is online self-directed learning under the guidance of output drive. Before class, teachers publish learning tasks through online learning platforms to present communication scenarios; students use online resources to look up learning materials to try to complete tasks; teachers will check and accept students' learning outcomes offline. The in-class stage is offline classroom teaching facilitated by input [22, 23]. The teacher describes the output task and provides learning materials; the students conduct selective learning based on the knowledge input by the teacher and complete the learning task through group cooperation to promote knowledge input and supplement the learning materials appropriately. The off-class stage is based on online corrections and classroom presentations under the evaluation

and promotion of learning. Teachers release output tasks, students complete output tasks online and conduct self-evaluation feedback and peer evaluation. Finally, the teacher will complete the teacher-student joint evaluation in the classroom.

3. Experimental Design of Blended College English Writing Teaching

3.1. Demand Analysis of Multimedia Education Courseware. In multimedia education courseware demand analysis looking at the current stage of English writing teaching, after years of exploration and hard work, its teaching theory has received considerable attention and has achieved a certain degree of development. Frontline teachers engaged in English writing teaching are still conducting research and thinking on related academic theories and practices. The purpose of teaching English writing is to learn the spelling, meaning, usage of words and related grammar of words that cannot be done without, and there are clear vocabulary requirements at each stage of English writing instruction. For those who require students to have only a rough idea of English composition at a certain stage, teachers should use appropriate exercises or other teaching methods to complete learning tasks. At the same time, there are still some problems in teaching writing in English.

Figure 1 shows that the courseware requirements mainly include teaching methods, teaching objectives, and teaching objects.

3.2. Test Subject. The object of this experimental research is the 6 parallel classes in the School of Mathematics and Physics of X University, and the choice of non-English majors is to exclude the students themselves from being extremely interested in English and to avoid the impact of the large gap between students' strengths on this experiment. Among them, the first three classes are experimental classes, with 54 students, 50 students, and 47 students. The experimental class uses a combination of multimedia teaching methods and traditional teaching methods; the remaining three groups are control classes, with 52, 49, and 51 students, respectively; the control class uses traditional teaching methods, with a total of 303 students in six classes. Before the experiment started, grades were analyzed for English writing papers in six parallel classes. The results showed that there were no significant differences between the grades of the six parallel classes.

3.3. Experimental Method

3.3.1. Teaching Experiment Method. Before the experiment started, the participating students were asked to take an English language test. Also, the same English teacher teaches English in six parallel classes, and there is no obvious difference in the methods of teaching English writing in these six classes. A written English test is given every semester, and a total of 6 English tests are given in one semester in order to maximize the objectivity of the experiment results, and

finally, the test data are analyzed and the results of the experiment are extracted.

3.3.2. Questionnaire Survey. The research tool used in the questionnaire survey method is the questionnaire. The questionnaire uses a five-level Likert scoring method, in which the score ranges from 1 to 5, denoting complete disagreement with this opinion, disagreement with this opinion, and none of these opinions: disagree, agree, and strongly agree; the higher the score, the more I agree with the opinion on the topic. However, in accordance with the real needs of this study, the questionnaire was revised and the reliability of the revised questionnaire was analyzed. The questionnaire includes four dimensions, namely, students' attitude towards writing in English, students' attitude towards teacher feedback, students' attitude towards peer feedback, and students' attitude towards mixed feedback.

4. Blended College English Writing Teaching

Reliability refers to the stability and credibility of the questionnaire. This article uses L. J. Cronbach's coefficient α method. The coefficient α can be obtained by analyzing the reliability in the SPSS software. In general, an α coefficient above 0.8 is considered evidence that the indexing effect is very good, and above 0.7 is also acceptable. Here, we analyze the reliability of each facility type, and the reliability index we choose for each facility type is slightly different. The results are presented in Table 1.

Table 1 and Figure 2 show that both the overall perceptions of reliability is biased towards clarity.

The overall reliability coefficient for this questionnaire is 0.912, which is higher than 0.9, indicating high reliability of the questionnaire. In addition, the reliability coefficients for the four dimensions of the questionnaire were analyzed separately. Students' attitude towards writing in English was 0.794, students' attitude towards teacher feedback was 0.894, and students' attitude towards peer feedback was 0.753. The mixed attitude towards feedback was 0.739. The reliability coefficients of all measurements are greater than 0.7, which indicates that the results obtained in this questionnaire have some reliability.

4.1. Analysis Based on the Pretest Scores of English Writing in Six Classes. The teaching experiment method is the main research tool to solve problems. Before the experiment, all students in the six classes were given the first English writing test at the same time to ensure the objectivity of the experimental results to the greatest extent. Finally, the test data was analyzed, as shown in Table 2. Analyze the collected data by sampling *t*-test in pairs for the six pretest scores, as shown in Table 3.

The mean pretest score of control class students is 61.34, and the mean pretest score of experimental class students is 61.55, which shows that there is almost no significant difference between control class and experimental class students' English proficiency before the experiment. To further examine the English proficiency level of control class and experimental class students, one-sided (one-sided) = 0.009 < 0.05

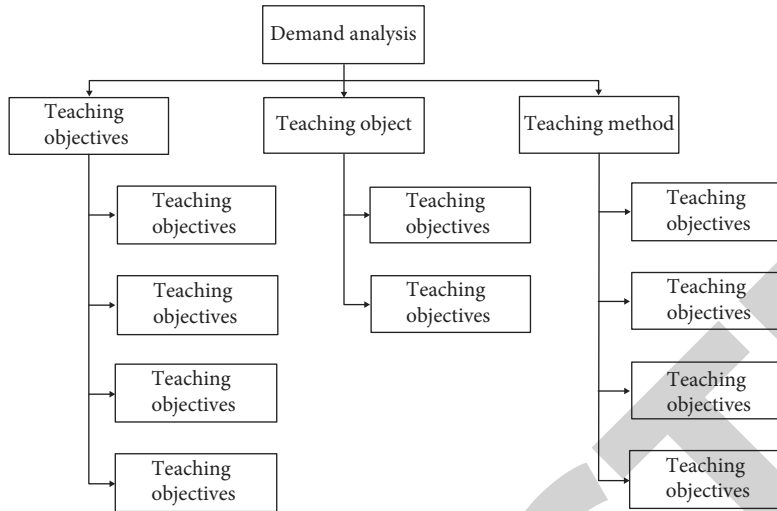


FIGURE 1: Multimedia education courseware demand analysis chart.

TABLE 1: Test results.

	Very clear and convenient	Clear and convenient	General	Not clear enough	Chaotic	Cronbach alpha
Overall reliability coefficient	0.327	0.408	0.144	0.087	0.034	0.912
Student attitude towards English writing	0.101	0.211	0.353	0.199	0.136	0.796
Student attitudes towards teacher feedback	0.174	0.294	0.259	0.177	0.096	0.894
Student attitude towards peer feedback	0.092	0.176	0.372	0.214	0.146	0.753
Student attitudes towards mixed feedback	0.062	0.105	0.398	0.263	0.172	0.739

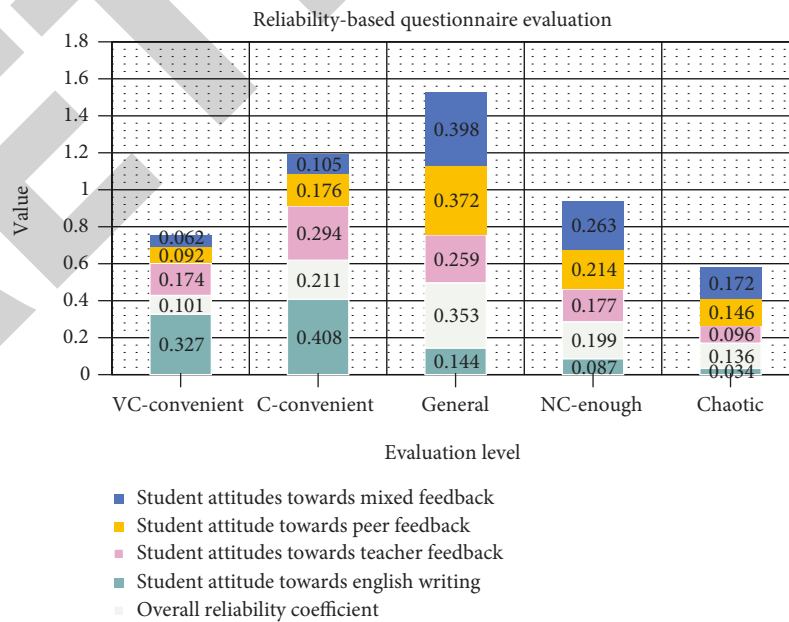


FIGURE 2: Reliability-based questionnaire evaluation result graph.

TABLE 2: Based on six classes of the English writing test score data table.

Class		N	Minimum	Maximum	Mean	Standard deviation
Experimental class	A	54	55.35	73.63	61.34	0.770
	B	50	56.12	77.42	61.75	0.919
	C	47	56.47	74.16	61.29	0.936
	D	52	56.33	75.22	62.12	0.774
Control class	E	49	55.87	73.92	61.93	0.765
	F	51	55.96	76.54	61.55	0.683

TABLE 3: Based on six classes of the English writing pretest result sample *t*-test data table.

Class		F	Sig. (unilateral)	t	df	Sig. (bilateral)	Mean difference
Experimental class	A	2.63	0.009	1.37	98.00	0.173	0.180
	B	2.39	0.007	1.37	82.71	0.134	0.136
	C	2.45	0.004	1.37	88.26	0.161	0.112
	D	1.36	0.005	1.37	87.39	0.192	0.180
Control class	E	1.67	0.010	1.37	91.45	0.174	0.136
	F	1.59	0.009	1.37	96.48	0.162	0.112

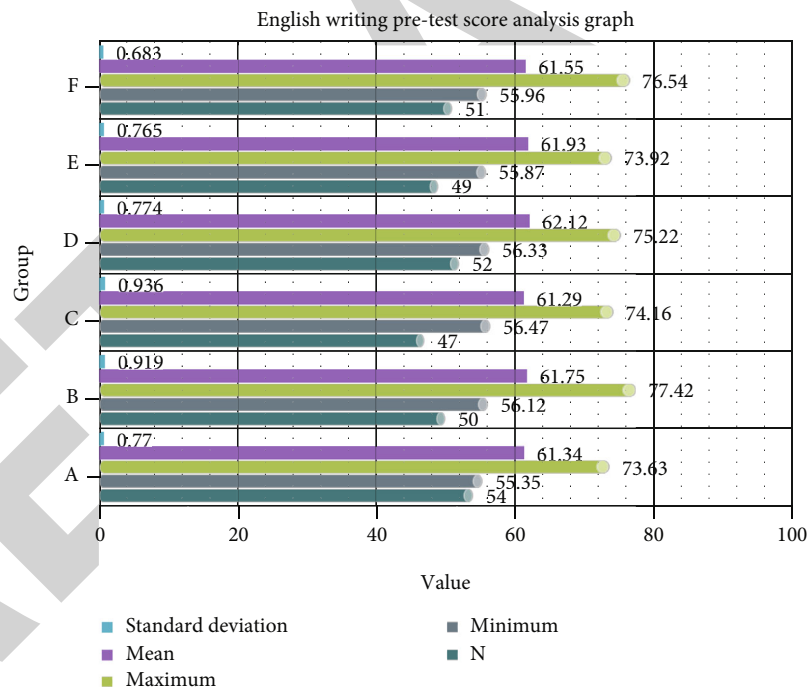


FIGURE 3: Based on six classes of the English writing pretest score analysis graph.

and two-sided (two-sided) = 0.174 > 0.05, indicating that the English proficiency level of control class and experimental class students is similar. There are no obvious differences. The specific situation is shown in Figure 3. This result is directly used to compare changes in teaching effects.

4.2. Analysis Based on the Results of the Follow-Up Written English Exam in Six Classes. In this experiment, teaching is done by a combination of the blended learning method

using multimedia technology and traditional teaching method. By analyzing the follow-up result data, it is possible to compare and analyze the English proficiency of the control class and the experimental class after the experiment. Is there any difference as shown in Table 4? Analyze the data using the paired *t*-test on the six posttest scores as shown in Table 5.

The mean value measured after the control session was 66.39, the mean value measured after the experimental

TABLE 4: Based on six classes of the English writing posttest score data table.

Class		N	Minimum	Maximum	Mean	Standard deviation
Experimental class	A	54	58.65	81.97	66.39	0.373
	B	50	59.33	82.63	67.25	0.279
	C	47	58.96	82.42	66.89	0.298
	D	52	63.24	77.74	64.36	0.670
Control class	E	49	64.16	76.66	63.74	0.899
	F	51	63.79	77.49	64.19	0.762

TABLE 5: Sample *t*-test based on six classes of English writing posttest scores.

Class		F	Sig. (unilateral)	t	df	Sig. (bilateral)	Mean difference
Experimental class	A	3.54	0.003	4.23	61.50	0.002	0.500
	B	3.60	0.001	4.23	63.92	0.002	0.439
	C	3.99	0.001	4.23	60.54	0.002	0.449
	D	2.96	0.004	1.96	79.94	0.001	0.363
Control class	E	2.84	0.001	1.96	80.66	0.001	0.267
	F	2.71	0.001	1.96	83.24	0.001	0.295

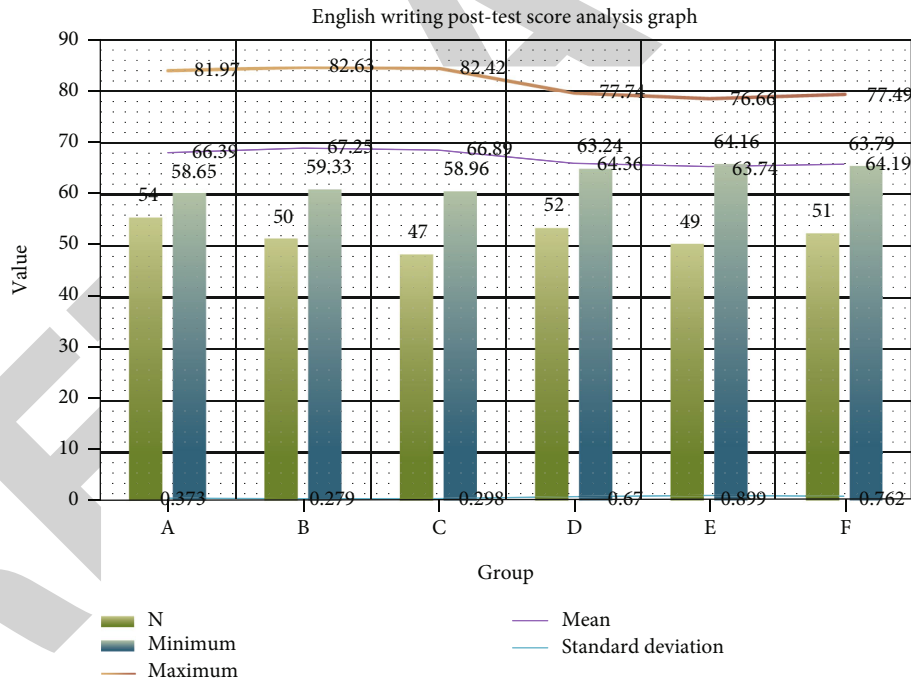


FIGURE 4: Based on the analysis of six classes of English writing posttest scores.

session was 63.74, and the mean value of the experimental session was slightly higher than the mean value of the control session. This shows that there is some difference in English proficiency between the control class and the experimental class. Compared to the control class, the experimental class improved slightly in English proficiency. Therefore, the blended learning method, which includes multimedia technology, is easier than the traditional teaching method. Let the students show interest and enthusiasm for writing in English. Of course, the control class also shows a slight improvement, prov-

ing that traditional teaching methods can also generate some interest in English writing in students. Significance (one-way) = 0.003 < 0.05 and significance (two-way) = 0.001 < 0.05, indicating a significant difference in English proficiency between the control class and the experimental class after the experiment. The specific situation is shown in Figure 4.

4.2.1. Before the Experiment, Students' Attitudes towards English Writing and Blended Teaching Methods Are Analyzed. This was to find out whether pupils' attitudes

TABLE 6: Student’s attitude data sheet before the experiment.

Class		Very clear and convenient	Clear and convenient	General	Not clear enough	Chaotic	P
Experimental class	A	1.92	1.63	2.42	1.3	2.4	0.736
	B	1.24	1.82	2.31	1.9	1.26	0.867
	C	2.03	2.41	1.36	2.05	1.32	0.779
	D	1.64	1.41	1.94	1.43	1.39	0.639
Control class	E	1.95	1.38	1.27	2.23	0.9	0.832
	F	2.05	2.04	2.18	1.56	1.45	0.794

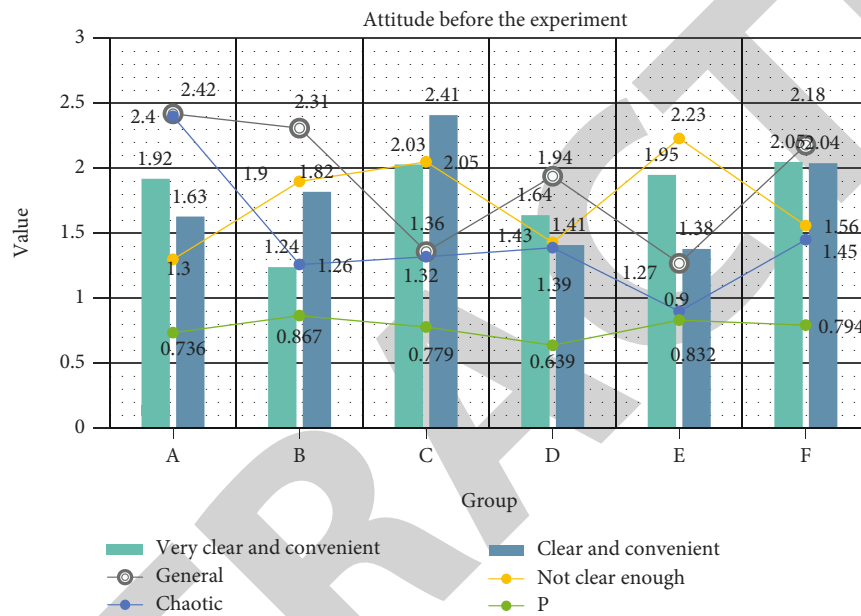


FIGURE 5: Analysis of student’s attitudes before the experiment.

TABLE 7: Data sheet of student’s attitudes after the experiment.

Class		Very clear and convenient	Clear and convenient	General	Not clear enough	Chaotic	P
Experimental class	A	3.93	3.36	3.6	3.28	3.58	0.001
	B	3.85	4.33	3.85	3.89	4.49	0.001
	C	4.81	4.29	4.93	4.7	4.24	0.001
	D	2.13	1.85	2.24	2.42	2.45	0.001
Control class	E	2.33	2.87	2.35	2.55	2.36	0.001
	F	2.24	2.31	2.77	2.83	2.31	0.001

towards writing in English and blended learning had changed. Before starting the experiment, all pupils in both classes were first questioned at the same time to find out the pupils’ attitudes to English writing and blended learning. The results are shown in Table 6.

From Figure 5, it can be seen that the *P* value of the six classes of students’ attitudes towards English writing and blended teaching methods is greater than 0.5, indicating that students’ attitudes towards English writing and blended teaching methods are basically similar. Without a subjective understanding, students’ attitudes towards

English writing and blended teaching methods do not have any good feelings.

4.2.2. *After the Experiment, Students’ Attitudes towards English Writing and Blended Teaching Methods Are Analyzed.* This was to find out whether pupils’ attitudes towards writing in English and blended learning had changed. After the experiment, all pupils in both classes were given a questionnaire to find out their attitudes to English writing and blended learning. The results are shown in Table 7.

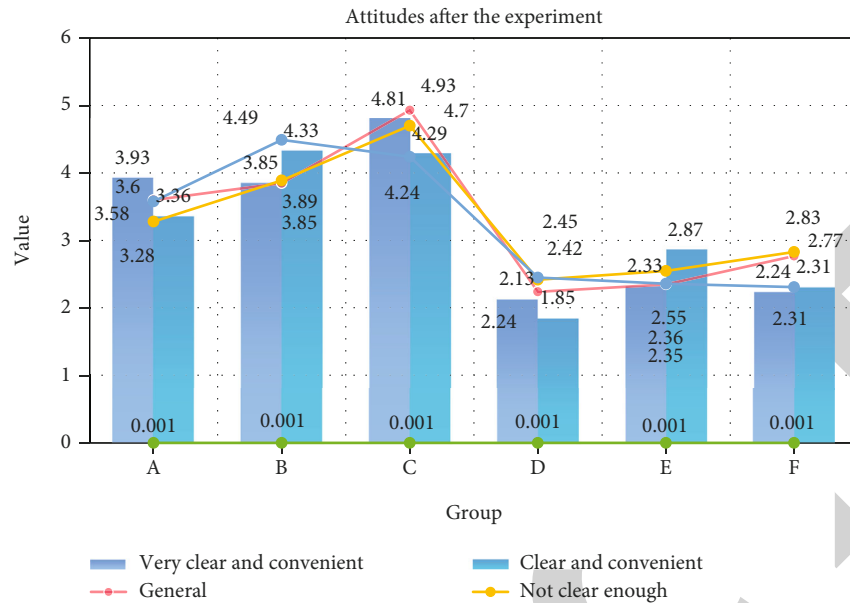


FIGURE 6: Analysis of student's attitudes after the experiment.

Figure 6 shows that students' attitudes towards English writing and blended learning have subjectively improved. At the same time, the P values of sixth grade students' attitude towards English writing and blended learning method are less than 0.05 in all six classes. It shows that the hybrid teaching method can improve students' ability to realize self-knowledge construction and reinforce learning effect; the repetition of multimedia curriculum conforms to the laws of memory and effectively helps students to remember knowledge repeatedly.

5. Conclusions

The improvement of the student's writing level happens by no means overnight; it requires long-term accumulation and practice of the learner. In the practice of English writing teaching, in addition to writing teaching methods, effective writing feedback methods are also an important teaching link to improve students' writing skills. Experimental study shows that students have positive attitude towards the blended method of teaching writing and that the blended method of teaching writing can increase students' interest in English writing and improve their performance. Analyzing the questionnaire results before and after the experiment in the experimental class, we can find that students' interest and confidence in writing in English increased compared to the period before the experiment. In this experiment, the mixed method of writing instruction was implemented in the experimental class. Although in practice the blended method of teaching writing requires more time, it can be concluded from the questionnaire and interview results that students are still quite satisfied with the blended method of teaching writing and positively evaluate the impact of the blended method of teaching writing.

As contacts and exchanges with foreign countries become closer and closer, the role of English in diplomatic

activities becomes more important; as foreign countries become more integrated in business development, the role of English in business activities becomes more important; as academic exchanges between local schools and foreign countries become more frequent, the role of English in academic activities becomes more important. Society is paying more and more attention to the teaching of English writing, which not only opens up more space for the development of English writing instruction but also puts greater demands on the teaching of English writing. Thanks to this study, we have a deeper understanding of the concept of multimedia technology and a stronger belief in the complementary role of multimedia in English writing instruction. The interactivity of multimedia software helps to achieve teacher-student interaction in class and human-computer interaction after class, and good interaction can improve students' self-knowledge ability and enhance the learning effect; the repeatability of multimedia software follows the law of memory and effectively helps students to remember repeatedly what they have learned.

This article mainly studies the application of the blended teaching method that incorporates multimedia technology to teach college English writing classes and verifies its influence on students' English writing attitudes and students' interest and writing achievements. Thanks to the application of a hybrid teaching method incorporating multimedia technology in the experimental class, the students in the class have made considerable progress. Students who did not have much interest in English writing classes developed interest and enthusiasm for English writing. In the experimental class, more and more students are confident and bold to express their feelings freely. The hybrid teaching method that incorporates multimedia technology can have a positive impact on cultivating students' interest and enhancing their self-confidence. By creating a harmonious atmosphere for students, confidence will be further enhanced. Because of this friendly environment, people's confidence in writing

ability has increased. Students' attitudes towards writing have changed, and they have become more active in English writing. This study is just a study of college English writing. You can consider studying in the same way in other disciplines to see how it works.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

References

- [1] Z. Lv and H. Song, "Trust mechanism of feedback trust weight in multimedia network," *ACM Transactions on Multimedia Computing, Communications, and Applications*, vol. 17, no. 4, pp. 1–26, 2021.
- [2] A. K. Singh, X. Liu, H. Wang, and H. Ko, "Recent advances in multimedia security and information hiding," *Transactions On Emerging Telecommunications Technologies*, vol. 32, no. 2, article e4193, 2021.
- [3] R. C. Schank, M. Korcuska, and M. Jona, "Multimedia applications for education and training: revolution or red herring?," *ACM Computing Surveys*, vol. 27, no. 4, pp. 633–635, 1995.
- [4] Z. Rabiei, F. Jahanpour, F. Azodi, and P. Azodi, "Effect of educational multimedia on anxiety before cesarean section," *Iranian Journal of Obstetrics, Gynecology and Infertility*, vol. 20, no. 5, pp. 24–29, 2017.
- [5] H. Kim, S. Park, and H. Chang, "A gap analysis study between multimedia security research and education by meta data analysis," *Multimedia Tools and Applications*, vol. 75, no. 20, pp. 12779–12793, 2016.
- [6] J. Hwang and S. Park, "LIDAB: a user-friendly display system for linked multimedia data and its application in education," *Multimedia Tools & Applications*, vol. 75, no. 21, pp. 13149–13162, 2016.
- [7] W. W. Ma, C. K. Chan, K. W. Tong, H. Fung, and C. W. R. Fong, "New ecology for education — communication X learning," 2017.
- [8] M. Bijani, B. Tehranineshat, F. Ahrari, and N. Beygi, "A comparison between multimedia and traditional education in encouraging adherence to treatment regimen in patients with hypertension," *The Open Hypertension Journal*, vol. 12, no. 1, pp. 1–6, 2020.
- [9] M. Alimohammadi and L. N. Samani, "The effects of multimedia-based puberty health education on male students' self-esteem in the middle school," *International Journal of Community Based Nursing and Midwifery*, vol. 7, no. 2, pp. 109–117, 2019.
- [10] P. M. Kumar, H. M. Pandey, and G. Srivastava, "Call for special issue papers: multimedia big data analytics for engineering education," *Big Data*, vol. 8, no. 2, pp. 87–88, 2020.
- [11] J. Y. Hong, H. Ko, L. Mesicek, and M. B. Song, "Cultural intelligence as education contents: exploring the pedagogical aspects of effective functioning in higher education," *Concurrence and Computation Practice and Experience*, vol. 33, no. 2, article e5489, 2019.
- [12] N. O. García, M. D. Velásquez, C. T. Romero, J. O. Monedero, and O. Khalaf, "Remote academic platforms in times of a pandemic," *International Journal of Emerging Technologies in Learning*, vol. 16, no. 21, pp. 121–131, 2021.
- [13] C. A. T. Romero, J. H. Ortiz, O. I. Khalaf, and W. M. Ortega, "Software architecture for planning educational scenarios by applying an agile methodology," *International Journal of Emerging Technologies in Learning*, vol. 16, no. 8, pp. 132–144, 2021.
- [14] Y. Han, "Exploring multimedia, mobile learning, and place-based learning in linguacultural education," *Language, Learning and Technology*, vol. 23, no. 3, pp. 29–38, 2019.
- [15] E. B. Kse, "A content analysis of studies related to technology and multimedia in biology education," *Journal of Educational Technology and Online Learning*, vol. 1, no. 2, pp. 1–15, 2018.
- [16] J. Chae, Y. Cho, M. Lee, S. Lee, M. Choi, and S. Park, "Design and implementation of a system for creating multimedia linked data and its applications in education," *Multimedia Tools & Applications*, vol. 75, no. 21, pp. 13121–13134, 2016.
- [17] L. Yongshan, "A mixed-type Galerkin variational formulation and fast algorithms for variable-coefficient fractional diffusion equations," *Mathematical Methods in the Applied Sciences*, vol. 40, no. 14, pp. 5018–5034, 2017.
- [18] A. Punzo and S. Ingrassia, "Clustering bivariate mixed-type data via the cluster-weighted model," *Computational Statistics*, vol. 31, no. 3, pp. 989–1013, 2016.
- [19] L. Amiri, M. Khazaei, and M. Ganjali, "Mixtures of general location model with factor analyzer covariance structure for clustering mixed type data," *Journal of Applied Statistics*, vol. 46, no. 11, pp. 2075–2100, 2019.
- [20] M. Dogan, "Phase transition of mixed type p-adic λ -ising model on Cayley tree," *P Adic Numbers Ultrametric Analysis & Applications*, vol. 10, no. 4, pp. 276–286, 2018.
- [21] Z. Wang, "The application of language awareness in college English writing teaching," *Open Journal of Modern Linguistics*, vol. 8, no. 3, pp. 54–60, 2018.
- [22] M. Park, "A study on teaching methods for college English writing classes through collaborative writing and process-based feedback," *The Korean Association of General Education*, vol. 14, no. 2, pp. 159–174, 2020.
- [23] C. Yerahm, "A systemic functional study of thematic organization in the English writing of Korean college students," *English Teaching*, vol. 72, no. 3, pp. 119–144, 2017.