# Influence of a New Media Data Interaction System on the Course Teaching Effect

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**Abstract—**The new media data interaction system is the product of the joint development of information technology, computer technology, and education reform, which has a certain impact on the traditional teaching model. To continuously improve the course teaching effect, the influence of the new system on the course teaching effect was investigated. Experimental and control classes were set and the number of each class and teaching time were confirmed. The experimental class adopted the new media data interaction system to assist the course teaching and made courseware of such a system through different methods, such as literature data, questionnaires, and experiment methods. Moreover, a pretest questionnaire and an in-class observation scale were designed and the experimental data were analyzed through *t*-test and statistical analysis. Results indicate there is no significant difference in student ability and academic performance between the experimental and control classes before participating in the study. After the participation, the mean scores of the in-class scale in the learning interest, learning attitude, and communication ability of the experimental class are 13.42, 13.26, and 16.37, respectively, which are significantly different from those of the conventional class ( $p < 0.05$). Thus, the new media data interaction system can improve the course teaching effect.

**Keywords—**new media, data interaction system, college course, teaching effect, *t*-test, statistical analysis

## 1 Introduction

As the main part of student life in colleges and universities, college course teaching is the basis of improving the professional skills of college students and helping them establish their outlook on life. With the continuous and deepening development of education and teaching modes, colleges and universities around the world are striving to achieve educational informatization development [1]. The main advantages of such development are reflected in the richness and personalized forms of educational information [2]. College leaders, teachers, and students in different fields and majors are gradually exposed to this form of education. As an inevitable trend of education development in the future, during the education informatization process, the updating

efficiency of teaching knowledge content is fast while breaking through the constraints of time and space in the traditional teaching mode [3]. Under this condition, college teachers must continuously improve their professional quality, use different teaching methods to stimulate students' learning performance in college teaching courses, correct students' learning attitudes in the learning process, and improve their communication and independent thinking skills.

Under the joint influence of 5G information technology, machine learning technology, data mining, and other artificial intelligence technologies [4], college education must continuously update technical equipment and then study teaching methods that match this technological equipment [5] to improve the expected teaching effect by updating the teaching methods of college courses. The new media data interaction system is a new product during the education informatization development process [6]. Its application in college course teaching is to use new media technologies to combine with texts, images, and videos in accordance with the target and objective of college course teaching [7], design the teaching courseware to achieve the teaching goal that attracts student attention, deepen their learning impression, enhance their understanding ability, improve their learning interest, correct their learning attitude, and strengthen their communication ability.

## 2 Literature review

At present, the new media data interaction system has gradually become a widely used teaching form in colleges and universities [8]. Researchers in related fields have carried out numerous theoretical analyses and empirical studies on teaching in colleges and universities that use the new media data interaction system. Tang [9] proposes a new multimedia-teaching model of the English language and discusses its advantages and disadvantages. The author experimented to investigate the feasibility of such teaching model. The results of the experiment demonstrated that the multimedia teaching model was more efficient than the traditional teaching method. The results of the interview revealed that the multimedia teaching model was influenced by equipment, the teachers' and students' operative ability of the equipment, the design of the teaching software, etc. This paper concludes that the multimedia-teaching model of the English language is feasible and effective. Secondly, in the teaching process, teachers should pay attention to the factors that influence multimedia teaching. Sunba and Rogers et al. [10] studied Bloom's classification and indicated teaching method and course duration effects on student performance with different assessment types at different cognitive levels. They further compared student performance in Matrix Clinical Qualities with their performance in short-answer questions. In general, within/relative to assessment type performance and at different levels of Bloom's classification, the MCQ scores of both groups were higher than short-answer questions at overall and most cognitive levels ($p \leq 0.05$). F/W F2F students scored higher than F/W online students on both assessment types and at most levels. The difference level varied with the assessment type. It indicated that changes in assessment type can affect the way students respond. Zhao [11] analyzed the effects of small and medium teaching method problems in the power electronic experiment on improving the effectiveness of the

problem-solving ability of students. The study aimed to make students in the power electronic experiment further understand the working principle of the circuit, help students' master relevant course content, and improve their independent problem-solving skills within one to two days for balancing the contradiction between class hours and class burden. Teachers raised some small questions according to the basic principle of the circuit, and students analyzed these questions theoretically. Subsequently, students got their answers and verified their conclusions through simulation and laboratory experiments. Through the analysis of the problem-solving process and result, most students were able to complete it independently and made correct conclusions. This method can improve students' problem-solving abilities. To improve the English learning ability of college students, Liang [12] analyzed the influence of multimedia and network mixed teaching methods on the physical education learning ability of college students. On the basis of the logistic regression analysis method, it designed multimedia mixed network and constructed the network node model of multimedia and network mixed teaching. An information acquisition model suitable for the English learning ability of college students was constructed, and an improved extreme study machine model was used to combine multimedia network teaching information with the English learning information of college students. The simulation results indicated that this method has high accuracy in analyzing the influence of multimedia and network mixed teaching on the English learning ability of college students. The method also improved the ability of college students to learn English. Hong and Feng et al. [13] used various modern teaching methods to improve the teaching effect of medical microbiology. They also adopted many modern teaching methods, such as multimedia teaching, QQ, WeChat, and MOOC, so that students could have a clear understanding of the micro-world and then ensure teaching quality. Chen et al. [14] determined the influence of classroom reverberation time (RT) and traffic noise level (TNL) on the English listening comprehension of Chinese college students. A total of 12 RT and TNL combination conditions (3 RT×4TNL) were designed in the experiment. Their effects on objective ELC accuracy and subjective student perception were also tested. The results showed that TNL had a significant negative impact on the English learning performance of students (including English learning accuracy and subjective perception), whereas RT had a small impact on such performance (only had a significant impact when TNL = 50 dB (A). Based on the experimental results, the indoor TNL limit for English immersion classrooms in China should not exceed 40dB (A). In addition, subjective student perception was sensitive to changes in acoustic conditions during the learning process. Reis et al. [15] comprehensively analyzed the success factors of the learning motivation of students from the theoretical perspective to the practical perspective. They demonstrated that one of the primary goals of teachers should be to motivate students to learn. This motivation could be a useful and powerful tool that enables students to participate in the learning process with project-based learning (PBL) and help them prepare for their future careers. As part of a biomedical engineering degree program, students were required to observe society and identify possible biomedical-related malfunctions or problems in daily life. Therefore, students were required to offer a solution by preparing a project and creating a prototype or a minimum-viable product. Reis et al. [15] also highlighted the added value of a project in the study process. The influence of this project was beyond the classroom. The project-based teaching method

may have a particular impact on students and thus on civil society. PBL can help high educational institutions to have a prominent social influence as innovation drivers and intervention forces.

Based on the analysis results of existing literature, the new media teaching mode has penetrated the education field comprehensively, which has a certain impact on the effects of education and teaching. However, it also had a certain difference due to different factors, such as learning interest and learning attitude. To improve the positive influence of the new media teaching mode on the teaching effect, the present study investigated the influence of the new media data interaction system on the course teaching effect. It found an effective way to improve the teaching effect through *t*-test and statistical analysis.

## 3 Methodology

### 3.1 Research purpose

This study aims to determine the influences of the new media data interaction system (with new media data interaction system/without new media data interaction system) and different presentation forms (texts, videos, and pictures, combination of text and video pictures) on the course teaching effect. This investigation is under the condition that the teaching content of the new media data interaction system is reflected by two presentation forms: (1) whether the academic performance of college students has been improved compared with that reflected by only one presentation form and in the actual teaching processes in colleges and universities, (2) whether the performance of students learning with the new media data interaction system has been improved compared with those who study without the new media data interaction system.

### 3.2 Research objective

**Objective source.** This study had two objective classes: Sophomore (1) and Sophomore (4) in the English Department of a university. They were taught by the same teachers, and the teaching results were the same. Sophomores were chosen mainly because they have adapted to the learning life and space of the university. They also have basic learning abilities, so the learning atmosphere was relatively relaxed and the learning mode was flexible. Based on the research on the effect of the new media data interaction system on college course teaching, the results were real. These students neither knew the experiment content nor its purpose when they participated in the study.

**Number of students.** Sophomore class (1) was an experimental class of 32 students in total. The new media data interaction system was used for auxiliary course teaching. Meanwhile, Sophomore class (4) was a control class of 31 students in total. They did not adopt the new media interaction system. Details are shown in Figure 1.

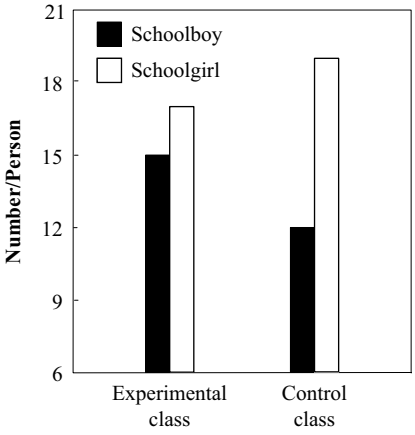


**Fig. 1.** Students participating in the research

**Teaching schedule.** The research was arranged from the beginning of April 2022 to the end of June 2022 (three months), involving four teaching content units. The teaching time during the research process was divided into two stages: data collection and influence study.

(1) The data collection stage took one month, with a total of eight lessons. During this period, teachers collected the materials required for English course explanation and prepared the courseware of the new media data interaction system.
(2) The influence research stage took two months, with a total of 16 lessons. During this period, teachers taught students in experimental and control classes. Teachers taught them twice a week and observed their learning conditions in class. A test was given each month, and the relevant test scores were recorded.

During the teaching process, another teacher of the same major was invited to supervise the teaching content of the two classes for ensuring the credibility of the research results.

### 3.3 Courseware making for the new media data interaction system

**Requirements.** The courseware of the new media data interaction system was offered to college students in the common class for auxiliary teaching. Teachers in colleges and universities could implement new media data interaction during the teaching demonstration process. Given the complex teaching content and teaching technology, students could obtain the teaching demonstration from teachers in the classroom through the new media data interaction system. Meanwhile, for some further difficult teaching content, teachers could explain to students while they were watching the courseware of the new media data interaction system. Relevant survey results indicated that most students knew the teaching mode of the new media data interaction system to different degrees in the process of theory learning course, which is mainly in the form of teaching video and PowerPoint (PPT). After using the new media data interactive

system courseware, students found that the new media data interactive system teaching mode was more vivid and intuitive than the traditional teaching mode. Moreover, this teaching mode was easier to accept.

**Courseware-making method.** Through PPT slides, the courseware of the new media data interaction system for college English course teaching was made using mind mapping and other different intelligent algorithms [16]. According to actual teaching requirements, images, sounds, and videos were added to the teaching content of the college English course. Subsequently, data processing and storage were implemented. As the most basic material in the courseware of the new media data interaction system during the teaching process of the college English course, the making of text materials should use corresponding teaching materials through different fonts, sizes, and colors according to the actual application requirements of PPT slides, so that college students can learn English clearly when watching the courseware.

The images required for the courseware making for the new media data interaction system from the English teaching resource network and English courseware-making network of different colleges and universities can be obtained and saved in the following ways:

(1) Save BMP, TIF, and JPG formats directly in the folder of the courseware of the new media data interaction system.
(2) Modify and save the English teaching images obtained by capturing software in PS software.
(3) Images required for making the courseware, but which cannot be obtained in the network and do not exist in real society or books, can be taken by a camera, processed in the PS software, and stored in JPG format.

Videos have a significant impact on the teaching process of college students [17], which is a direct embodiment of English applications. The video production of the courseware of the new media data interaction system is mainly based on the teaching materials of the college English course. It combines English competitions and teaching videos of different majors and under different application environments.

**Courseware content.** Relevant research results suggest that actively participating in teaching activities can improve the subjective initiatives of students if they can have comfortable experiences during the English teaching process [18], which not only can improve the course teaching effect but also can promote their potential development in a relatively comfortable environment. The courseware of the new media data interaction system organically combines texts, images, and videos with other new media that can stimulate student emotion, so that students can construct image perception and thus enhance their interest in the learning knowledge of college courses. The courseware can be divided into the following parts: professional English nouns, writing exercises, oral exercises, error corrections, and practical applications.

### 3.4 Research methods

**Literature method.** Articles and papers in related fields and actual college English course teaching and competition materials are of high quality. During the courseware

making for the new media data interaction system for college English course teaching, teachers referred to college English courseware made by several famous international colleges and universities and collected relevant information to ensure the representativeness and advancement of the teaching courseware of the new media data interaction system. Moreover, they improved the scientificity of the teaching courseware in the application of the actual college English course. Furthermore, teachers ensured the accuracy and comprehensiveness of the research results affected by the course teaching effect of the new media data interaction system.

**Interview method.** To have a detailed consultation on the methods used in college English teaching, an interview was conducted with experts and teachers who have been engaged in the field for a long time.

**Questionnaire method.** (1) Pretest questionnaire. The main purpose of the pretest questionnaire was to understand the basic situation of the college English course teaching grasped by students in experimental and control classes, which could be summarized into three aspects: learning interest, learning attitude, and communication ability. A total of nine questions were designed from the three aspects. The options for different questions were divided into four levels: completely consistent, basically consistent, normal, and inconsistent, and the score levels were 5, 4, 3, and 2, respectively. The higher the score, the higher the problem level. (2) In-class observation scale. The in-class observation scale was consistent with the pretest questionnaire. A total of nine questions were designed from three aspects: learning interest, learning attitude, and communication ability. The options of different questions were divided into five levels: excellent, good, neutral, not good, and bad, and the score levels were 5, 4, 3, 2, and 1 respectively. The higher the score, the higher the problem level.

**Experimental method.** After the end of teaching in experimental and control classes, experts were invited to conduct a special technical assessment together. Both classes took written and oral English tests and the results were used as the analysis basis [19]. The whole assessment process was tested by experts, teachers, and supervisors. Experts were responsible for the assessment content, and they did not know which class each student belonged to. The assessment was taken for the two classes at the same time. Subsequently, data information was collected, summarized, and analyzed (all research data were counted and analyzed by SPSS 21.0) [20]. Conclusions were made, and effective suggestions were provided. Table 1 presents that the scores of written and oral English test met the assessment standards.

**Table 1.** Written and oral English test scores that met the assessment standards

| **Written Examination Results (Full Score: 100 Points)** | | **Oral Examination Results (Full Score: 20 Points)** | |
|---|---|---|---|
| **Score** | **Evaluation** | **Score** | **Evaluation** |
| Higher than 90 points | Excellent | Higher than 18 points | Excellent |
| 80–90 points | Good | 16–18 points | Good |
| 70–80 points | Secondary | 14–16 points | Secondary |
| 60–70 points | Pass | 12–14 points | Pass |
| Less than 60 points | Bad | Less than 12 points | Bad |

# 4 Results analysis

## 4.1 Before participating in the research

**Data statistical results of questionnaires.** A total of 63 questionnaires were distributed to experimental and control classes, of which 32 and 31 questionnaires were distributed, respectively. All questionnaires were collected with a recovery rate of 100%. Table 2 presents the statistical results of the basic situation of English learning before the participation of students in experimental and control classes.

**Table 2.** Statistical results of the basic situation of English learning before the participation of students in experimental and control classes

| Test Topic | | Class | Statistical Result | | | |
|---|---|---|---|---|---|---|
| | | | Completely Consistent | Basically Consistent | Commonly | Atypism |
| Learning interest | I like English very much. | Experimental class/person | 6 | 11 | 15 | 0 |
| | | Regular shift/person | 7 | 8 | 16 | 0 |
| | I will actively use English for dialogue. | Experimental class/person | 6 | 13 | 11 | 2 |
| | | Regular shift/person | 5 | 12 | 10 | 4 |
| | I like English the most of all the school courses. | Experimental class/person | 4 | 11 | 13 | 4 |
| | | Regular shift/person | 3 | 10 | 14 | 4 |
| Learning attitude | English courses consume the most time. | Experimental class/person | 4 | 11 | 12 | 5 |
| | | Regular shift/person | 6 | 10 | 11 | 4 |
| | Be able to complete homework actively and conscientiously after each class | Experimental class/person | 8 | 12 | 11 | 1 |
| | | Regular shift/person | 9 | 10 | 10 | 2 |
| | Study hard and strive for the top | Experimental class/person | 7 | 14 | 10 | 1 |
| | | Regular shift/person | 5 | 13 | 10 | 3 |
| Communication ability | Be able to express their views actively and clearly | Experimental class/person | 5 | 9 | 15 | 3 |
| | | Regular shift/person | 3 | 10 | 14 | 4 |
| | Actively communicate with peers and face difficulties together | Experimental class/person | 2 | 13 | 16 | 1 |
| | | Regular shift/person | 3 | 15 | 13 | 0 |
| | I hope I can continue to learn and communicate with you after class. | Experimental class/person | 4 | 9 | 18 | 1 |
| | | Regular shift/person | 2 | 11 | 18 | 0 |

Table 2 indicates no significant difference between experimental and control classes in learning interest, learning attitude, and communication ability, which was also the basic condition for the research on the influence of the new media data interaction system on the course teaching effect.

**Analysis of written English test scores.** Before participating in the research, the written examination results of both classes were obtained. Such data were analyzed through the constructed *t*-test, as shown in Table 3.

**Table 3.** Sample *t*-test results of written examination scores of two classes before participating in the research

| Class | Experimental Class | Control Class |
|---|---|---|
| Number | 32 | 31 |
| Average score | 81.35 | 80.78 |
| Standard deviation | 4.813 | 4.859 |
| *T* value | −0.406 | |
| Statistical *p* value | 0.667 | |

As presented in Table 3, before participating in the research, the average value and standard deviation of the written test scores of the experimental class were 81.35 points and 4.813, whereas those of the control class were 80.78 points and 4.859, respectively. No significant difference was found between the two classes. The *p* value was 0.667 ( $p > 0.05$), which indicated no significant difference between the written test scores of the two classes.

## 4.2 After participating in the research

**Analysis of learning interest.** After completing the research, the in-class observation scale was used to analyze the learning interest of the two classes. The data analysis is presented in Table 4.

**Table 4.** Data analysis results of learning interest

| Class | Experimental Class | Control Class |
|---|---|---|
| Number | 32 | 31 |
| Average score | 13.42 | 11.61 |
| Standard deviation | 2.758 | 3.749 |
| *T* value | −2.555 | |
| Statistical *p* value | 0.018 | |

Table 4 indicates that after participating in the research, the average value and standard deviation of the learning interest of the experimental class were 13.42 points and 2.758, whereas those of the control class were 11.61 points and 3.748, respectively. A significant difference was observed between the two classes, and the *p* value was 0.018 ( $p < 0.05$), which indicated the significant difference between the learning

interests of the two classes. Students in the experimental class were more interested in learning college English courses than those in the control class after the use of the new media data interaction system, that is, the use of the new media data interaction system for auxiliary teaching can enhance enthusiasm and interest in student learning.

**Analysis of learning attitude.** After completing the research, the in-class observation scale was used to analyze the learning attitude of the two classes. The data analysis is depicted in Table 5.

**Table 5.** Data analysis results of learning attitude

| Class | Experimental Class | Control Class |
|---|---|---|
| Number | 32 | 31 |
| Average score | 13.26 | 11.83 |
| Standard deviation | 2.340 | 2.996 |
| *T* value | −0.506 | |
| Statistical *p* value | 0.020 | |

Table 5 presents that after participating in the research, the average value and standard deviation of the learning attitude of the experimental class were 13.26 points and 2.340, whereas those of the control class were 11.83 points and 2.996, respectively. A significant difference was found between the two classes, and the *p* value was 0.020 ($p < 0.05$), which indicated a significant difference between the learning attitudes of the two classes. Students in the experimental class were more interested in learning the college English course than those in the control class after the use of the new media data interaction system, that is, the use of the new media data interaction system for auxiliary teaching can enhance enthusiasm and interest in student learning. The new media data interaction system significantly improved the learning attitude of students in the experimental class. These students also had extensive communication during the learning process with the aid of the new media data interaction system. As a result, the stiff and dead silence classroom teaching became more vivid than usual, so students became active and open. The desire of students for knowledge was improved. They asked different questions and discussed with their teachers, which played a positive role in realizing the teaching objectives of college courses.

**Analysis of communication skills.** After completing the research, the in-class observation scale was used to analyze the communication skills of the two classes. The data analysis is shown in Table 6.

**Table 6.** Data analysis results of communication skills

| Class | Experimental Class | Control Class |
|---|---|---|
| Number | 32 | 31 |
| Average score | 16.37 | 14.75 |
| Standard deviation | 2.367 | 3.398 |
| *T* value | −2.576 | |
| Statistical *p* value | 0.018 | |

Table 6 shows that after participating in this study, the average value and standard deviation of the communication ability of the experimental class were 16.37 points and 2.367, whereas those of the control class were 14.75 points and 3.398, respectively. A significant difference was observed between the two classes. The $p$ value was 0.020 ($p < 0.05$), which indicated the significant difference between the communication skills of the two classes. The communication skills of students in the experimental class with the aid of the new media data interaction system were higher than that of students in the control class. The experimental class often had communication and discussions on one question between teachers and students or students and students, which increased their communication skills and improved the "learning without any communication" problem. It not only solved knowledge problems and consolidated knowledge points in the process of consulting with others or helping others to solve problems but also improved their communication skills.

According to the $t$-test results in Tables 5–7, significant differences were found between experimental and control classes in learning interest, learning attitude, and communication skills ($p < 0.05$). After using the new media data interaction system, the overall learning ability of students in the experimental class was improved, which was significantly better than that of students in the control class.

**Analysis of written examination results.** After completing the research, a written examination was made for the two classes. Subsequently, the examination results were analyzed. The data analysis is shown in Table 7.

**Table 7.** Analysis of written examination results

| Class | Experimental Class | Control Class |
|---|---|---|
| Number | 32 | 31 |
| Average score | 89.06 | 83.00 |
| Standard deviation | 5.327 | 6.321 |
| $T$ value | −3.164 | |
| Statistical $p$ value | 0.004 | |

As presented in Table 7, the mean and standard deviation of the written test results of students in the experimental class were 89.06 and 5.327, whereas those of the results of students in the regular class were 84.00 and 6.321, respectively, with a larger variability than the two classes. Meanwhile, the statistical $p$-value result was 0.004, with a $p$ value less than 0.05. Therefore, the written test results of the two classes produced significant variability after participating in the study. Students in the experimental class scored significantly higher than those in the regular class on the written test assessment after using the new media data interaction system for supplemental instruction.

According to the analysis results in Table 3, the average written examination score of students in the experimental class increased from 81.35 points to 89.06 points, with an average increase of 7.71 points. By contrast, the average written examination score of students in the control class increased from 80.78 points to 83.00 points, with an average increase of 2.22 points, which was 5.49 points less than those of students in the experimental class. Thus, the new media data interaction system had significant effects on improving the written examination scores of college students.

# 5 Managerial implications

## 5.1 Enhance the professional skills of teachers and ensure the application frequency of the new media data interaction system

As the key to college teaching development, the course teaching effect is also the basic guarantee to improve the quality education of college students. College teachers must adapt to education development, change the educational concept, improve students' cognitive level, and fully understand the real correlation between the new media data interaction system and the course teaching effect.

(1) College teachers should fully understand the current form of education development and different advanced teaching technologies in the education development process. They must also know the key value and significance of these advanced teaching technologies in the actual course teaching process. At the same time, on the basis of mastering the current situation of college course teaching to the maximum extent, it can be familiar with the technical advantages of the new media data interaction system in course teaching in colleges and universities.
(2) During the practical teaching process in colleges and universities, the reasonable application of the new media data interaction system cannot be too superficial but must pay real attention to the system itself. As for the scientific application of the new media data interaction system during the teaching process, the application frequency and effect of the system should be promoted, so that it can play its role to the maximum extent and that the course teaching effect in the application of the new media data interaction system can achieve the expected teaching effect.

## 5.2 Combine new media data interaction teaching and traditional teaching organically, to improve the teaching effect

The new media data interaction system undeniably has its advantages in college course teaching. Other teaching models used in the past also have their existence significance and application value. If paid too much attention to the application of the new media data interaction system in the actual course teaching process, then the teaching methods and contents used by college teachers during the teaching process can have a large probability replaced by the new media data interaction system. This factor can hurt the key knowledge of college course teaching. In addition, if teachers rely on the application of the new media data interaction system excessively, then the thinking mode of college students can be constrained to a certain extent. Such a situation can have adverse effects on the expansion and exercise of their thinking skills.

With respect to the above problems, college teachers need to deeply understand the status of the new media data interaction system in college course teaching and combine the teaching mode of this system with the traditional teaching mode, so that both modes can improve the course teaching effect together. During the course teaching process, college teachers can judge what knowledge can be taught by the new media data interaction system and by the traditional teaching mode according to differences

in knowledge points. Therefore, a good interaction with college course knowledge can be formed through the integrated application of the traditional teaching mode and the new media data interaction system.

### 5.3 Increase capital investment and timely update equipment and facilities of the new media data interaction system

During the process of using the new media data interaction system for college course teaching, its equipment and facilities are the main auxiliary tools to guarantee the course teaching effect. To improve the teaching effect, colleges and universities must increase fund investment to ensure that the equipment and facilities of the new media data interaction system are updated in time in the application of college course teaching. Meanwhile, the system should be continuously applied and must be maintained in time, so that students can obtain a good sense of experience and learning atmosphere when they use the new media data interaction system for learning. Only in this way can the thinking skills of college students be expanded and the utilization rate of the new media data interaction system be improved, both of which are the inevitable requirements for the concept of quality education in colleges and universities. The equipment included in the new media data interaction system should be updated and maintained to improve the experience and its application efficiency. Therefore, the system can be effectively combined with demonstration and practical teachings and other traditional teaching modes to realize the overall permeability of teaching knowledge, strengthen the learning effects of college students, exercise the minds of college students effectively, and achieve the expected course teaching effect.

### 5.4 Urgently improve multimedia courseware-making technology

At present, the quality of the courseware of the new media data interaction system commonly used in college course teaching is good or bad. Some courseware only copies the book content of the system and uses its screen equipment as an electronic blackboard. Other courseware is more apparent than real. Videos or pictures are beautiful, but the actual content is poor, which cannot reflect network, interaction, and other functional advantages in the new media data interaction system.

To address these abovementioned problems, the improvement of the course teaching effect must be taken as the core in the actual courseware making for the new media data interaction system required by college teaching courses. Moreover, content clarity and structure rationality should be given further attention. Meanwhile, the learning interest and memory effect of students must be strengthened by stimulating their different senses, rather than pursuing tedious and lengthy courseware. At the same time, the actual needs of college students and the basic requirements of the Ministry of Education for college education in the courseware making for the new media data interaction system should be analyzed and clarified. Courseware quality must also be continuously improved through feedback information collection, statistics, and analysis. During the actual teaching process, college teachers can select the teaching knowledge point and courseware content combined with the unified textbook compilation according to the

actual environments of colleges and universities and optimize the courseware structure and presentation mode. Doing so not only can ensure the courseware quality of the new media data interaction system but also can recreate existing courseware.

## 6 Conclusion

This study explored the influence of the new media data interaction system on the course teaching effect. It also set experimental and control classes. The experimental class adopted the new media data interaction system for auxiliary teaching. Through comparison, the performance and learning skills of students in both classes before and after participating in the research improved. After adopting the new media data interaction system for auxiliary teaching, students in the experimental class not only improved their written and oral test scores but also showed a higher interest in English learning, a more serious learning attitude, and stronger communication ability than usual.

The new media data interaction system brings a new development direction to course teaching in colleges and universities. It also provides a new direction for college education development. Future research on the new media data interaction system will hopefully provide improved teaching environments and methods for the overall college course development.

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## 8 References

[1] Zheng, H., Perez, Z. (2019). Design of multimedia engineering teaching system based on internet of things technology. International Journal of Continuing Engineering Education and Life-long Learning, 29(4), 293–305. https://doi.org/10.1504/IJCEELL.2019.102772

[2] Shearer, B., Ramirez, K., Dorsainville, G., Harnik, V., Rosenfeld, M. (2020). Teaching cutaneous sensory distribution of the upper limb using interactive virtual reality. The FASEB Journal, 34(S1), 1–10. https://doi.org/10.1096/fasebj.2020.34.s1.07167

[3] Chen, H., Huang, J. (2021). Research and application of the interactive English online teaching system based on the internet of things. Scientific Programming, S1, 1–10.

[4] Tian, G., Darcy, O. (2021). Study on the design of interactive distance multimedia teaching system based on VR technology. International Journal of Continuing Engineering Education and Life-Long Learning, 31(1), 65–67. https://doi.org/10.1504/IJCEELL.2021.10034675

[5] Moheit, L., Schmid, J. D., Schmid, J. M., Eser, M., Marburg, S. (2021). Acoustics apps: Interactive simulations for digital teaching and learning of acoustics. The Journal of the Acoustical Society of America, 149(2), 1175–1182. https://doi.org/10.1121/10.0003438

[6] Wang, L., Xu, Z. (2021). An English learning system based on mobile edge computing constructs a wireless distance teaching environment. Mobile Information Systems, (1), 1–9.

[7] Gomez, J. T., Rodriguez-Hidalgo, A., Naranjo, Y., Pelaez-Moreno, C. (2021). Teaching differently: The digital signal processing of multimedia content through the use of liberal arts. IEEE Signal Processing Magazine, 38(3), 94–104. https://doi.org/10.1109/MSP.2021.3053218

[8] Bentaa, D., Bologaa, G., Dzitaca, S., Dzitaca, I. (2015). University level learning and teaching via E-learning platforms, Procedia Computer Science, 55, 1366–1373. https://doi.org/10.1016/j.procs.2015.07.123

[9] Tang, X. (2021). Study on the application of multimedia in English language teaching. CSEE 2011: Advances in Computer Science, Environment, Ecoinformatics, and Education, 293–297. https://doi.org/10.1007/978-3-642-23339-5_53

[10] Sunba, K., Rogers, K. (2020). The effect of teaching methodology and course duration on student performance at different assessment types across different cognitive levels as defined by bloom's taxonomy. The FASEB Journal, 34(1), 1–11. https://doi.org/10.1096/fasebj.2020.34.s1.09120

[11] Zhao, G. (2021). Effect analysis of small-problem-based teaching method for improving students' problem-solving ability in the experiment of power electronics course. IET Circuits, Devices & Systems, 15, 560–570. https://doi.org/10.1049/cds2.12051

[12] Liang, R. (2019). Analysis of the influence of multimedia network hybrid teaching method on college students learning ability in physical education. International Journal of Continuing Engineering Education and Life-Long Learning, 29(1–2), 101–112. https://doi.org/10.1504/IJCEELL.2019.099249

[13] Hong, Y., Feng, B., Kd, A., Feng, C. A., Yun, J., Jian, B. (2019). Using a variety of modern teaching methods to improve the effect of medical microbiology teaching. Procedia Computer Science, 154, 617–621. https://doi.org/10.1016/j.procs.2019.06.097

[14] Chen, Q., Ou, D. (2021). The effects of classroom reverberation time and traffic noise on English listening comprehension of Chinese university students. Applied Acoustics, 179, 108082. https://doi.org/10.1016/j.apacoust.2021.108082

[15] Reis, S., Coelho, M. F., Coelho, L. (2020). Success factors in students' motivation with project based learning: From theory to reality. International Journal of Online and Biomedical Engineering (iJOE), 16(12), 4–14. https://doi.org/10.3991/ijoe.v16i12.16001

[16] Haviz, M. (2020). Development of teaching materials by using thinking map on embryology learning. International Journal of Online and Biomedical Engineering (iJOE), 16(5), 150–159. https://doi.org/10.3991/ijoe.v16i05.13437

[17] Campbell, J., Macey, A., Chen, W., Shah, U. V., Brechtelsbauer, C. (2020). Creating a confident and curious cohort: The effect of video-led instructions on teaching first-year chemical engineering laboratories. Journal of Chemical Education, 97(11), 4001–4007. https://doi.org/10.1021/acs.jchemed.0c00406

[18] Guan, N., Song, J., Li, D. (2018). On the advantages of computer multimedia-aided English teaching. Procedia Computer Science, 131, 727–732. https://doi.org/10.1016/j.procs.2018.04.317

[19] Li, X. (2019). Characteristics and rules of college English education based on cognitive process simulation. Cognitive Systems Research, 57(10), 11–19. https://doi.org/10.1016/j.cogsys.2018.09.014

[20] Yang, S. (2020). Experimental data analysis of college English teaching based on computer multimedia technology. Computer-Aided Design and Applications, 17(2), 46–56. https://doi.org/10.14733/cadaps.2020.S2.46-56

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