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Research Article

Assistant Teaching of Hurdle Technology Based on Mobile Communication Multimedia Technology and MVP Theory

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In order to solve the problem that multimedia technology cannot give full play to its technical advantages, a method of assisted teaching in hurdle technology based on mobile communication multimedia and MVP theory is proposed. In this mode, the system adopts a layered structure design, which can reduce the coupling between modules, realize the reuse of platform business logic code, and improve the maintainability of the entire system. The average technical evaluation score of the experimental class was 89.28, and that of the control class was 80.64. Meanwhile, the standard deviation was lower than that of the control class. A lower standard deviation indicates that the sample data is less distributed and that the population value is closer to the mean. That is to say, the technical evaluation scores of the experimental class were generally in the middle, and there was a significant difference between the two classes ($P < 0.05$). The results of the pilot study showed that with the aid of mobile communication multimedia teaching technology, students' interest in preventing technology learning is increasing, verifying the validity of the experiment.

1. Introduction

Advances in scientific and technological research and the widespread use of information technology have had different impacts on all areas of life. In education, the advent of multimedia technology has somehow had a profound impact on traditional teaching. With the support of multimedia technology, traditional teaching can more comprehensively reflect the multidimensional and integrated characteristics of the technology. Using these features, teachers can clearly identify the key topics and difficult topics in teaching intuitively. With the advantage of mobile multimedia technology, the characteristics of traditional classroom teaching can be retained and the teaching effect can be further improved [1]. Physical education curriculum teaching, especially the technical physical education practice teaching itself, must rely on the practical education process, which requires physical education teachers to pay attention to technical explanation and skill teaching. However, compared with the traditional classroom disciplines, the physical education technology curriculum has a more open teaching environment and has more room to play in the innovation and practice of teaching methods [2]. The starting point of MVP theory is to provide more real and reliable experimental data for teaching innovation experiments by comprehensively explaining the relationship between students' curriculum learning motivation, learning willpower, and achievement. On the basis of fully absorbing the characteristics of multimedia teaching, it can better realize the integration with multimedia teaching methods, which can not only guide the curriculum design of multimedia teaching but can also ensure the integration effect of theory and practice in the process of curriculum experiment. This study takes hurdle physical education courses as the research object. In the process of studying the application of MVP theory in hurdle technology-assisted teaching, this study designs a platform based on mobile communication multimedia technology to better improve the effect of MVP theory-assisted teaching, as shown in Figure 1.

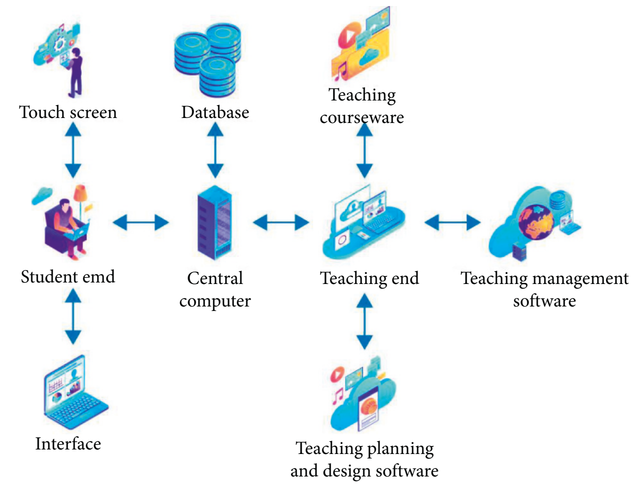

Figure 1: MVP theory-assisted instruction.

2. Literature Review

Yu, H., and others said that although the amount of multimedia research related to teaching and learning is increasing, the research on multimedia learning is far from enough [3]. Sang and others said that some theories and models try to organically combine motivation, will, and learning, but they all have their own limitations [4]. Kairu and others said that Keller's mature ARCS Model on motivation, learning, and achievement integrates the concept, theory, and motivation design program of motivation but omits the theory of will and information processing [5]. Li, S., and others said that academic circles all over the world recognize that the measurement standard of a country's educational development level includes computer-assisted instruction. The author believes that the development degree of education is closely related to computer-assisted instruction, which is the standard to measure the educational level of teachers in a country [6]. Therefore, its research and application are very important. Even in daily life, multimedia has become an indispensable helper for every family in the United States. Li, W., and others said that the United States issued a policy on paying attention to the application of computers in teaching as early as 1989. The report on popularizing science–American 2061 plan pointed out that CAI teaching is popularizing science, and it is an important plan in national education [7]. Khozaei and others said that, for example, teachers in primary and secondary schools would leave part of the answers about searching for a question on the Internet to help primary and secondary school students obtain rich extracurricular knowledge [8]. Thurm and others said that American institutions of higher learning have more diversified applications of computer assistance. Teachers' teaching, students' thesis research, scientific research data query, information communication, and multimedia play a positive role [9]. Li, W., and others said that China's multimedia teaching started late and was introduced in the 1970s. In the 1980s, multimedia-assisted teaching began to be applied to college teaching [10]. Li and others said that the initial equipment was also very simple, using wall charts, slides, and models for teaching, but it was only applied in colleges and universities. At that time, the conditions of nine-year compulsory education were not mature. In view of the current situation of China's large population, if each school is equipped with the same multimedia teaching facilities, it is relatively difficult, and most of the teachers at that time graduated from normal schools and technical schools by graduation, they are not exposed to multimedia teaching, and their teaching level is limited, not to mention the use of electronic media for teaching [11]. However, after continuous development and the joint efforts of educators, some teaching equipment, such as slides and projection, video, and recording, began to be put into the classroom for teaching. At that time, this technology was called audio-visual teaching. Cheng et al. said that the current research situation in China and the theory of instructional design have received the attention of Chinese educational theory circles for a long time [12]. And many of them are about constructivist learning theory. For example, the research on the relevant master's thesis of a normal university scholar in recent years includes "Research on biology teaching design and application of junior middle school based on Constructivism," "Research on e-learning environment based on motivation design mode," "Research on mathematics teaching design of senior high school based on Constructivism," etc. There is also much content on the advantages and disadvantages of multimedia teaching, such as the exploration of middle school physics multimedia teaching and learning efficiency. There are also many multimedia teaching-related papers published. However, most of the research is not very systematic, and there is no complete theory to support multimedia teaching.

3. Method

The mobile teaching platform adopts the layered design mode of C/S and B/S. Learners log in and use the platform functions through the Android client. At the same time, in order to make it more convenient for teachers to use the platform, teachers edit and manage the resources uploaded by students and themselves through a web browser on the PC side. The administrator also manages the platform through web browsing on the PC side, manages student and teacher information, database information, and user permissions, and maintains the normal operation and use of the platform [13]. The system adopts a layered structure design, which can reduce the coupling between modules and realize the reuse of platform business logic code. Functional modules can be divided according to business logic, and the modules interact through interfaces, which is convenient for structure and dynamic update of client plug-ins. Thus, the maintainability of the whole system is improved.

The hierarchical architecture model of the mobile teaching platform involved in this study includes four layers:

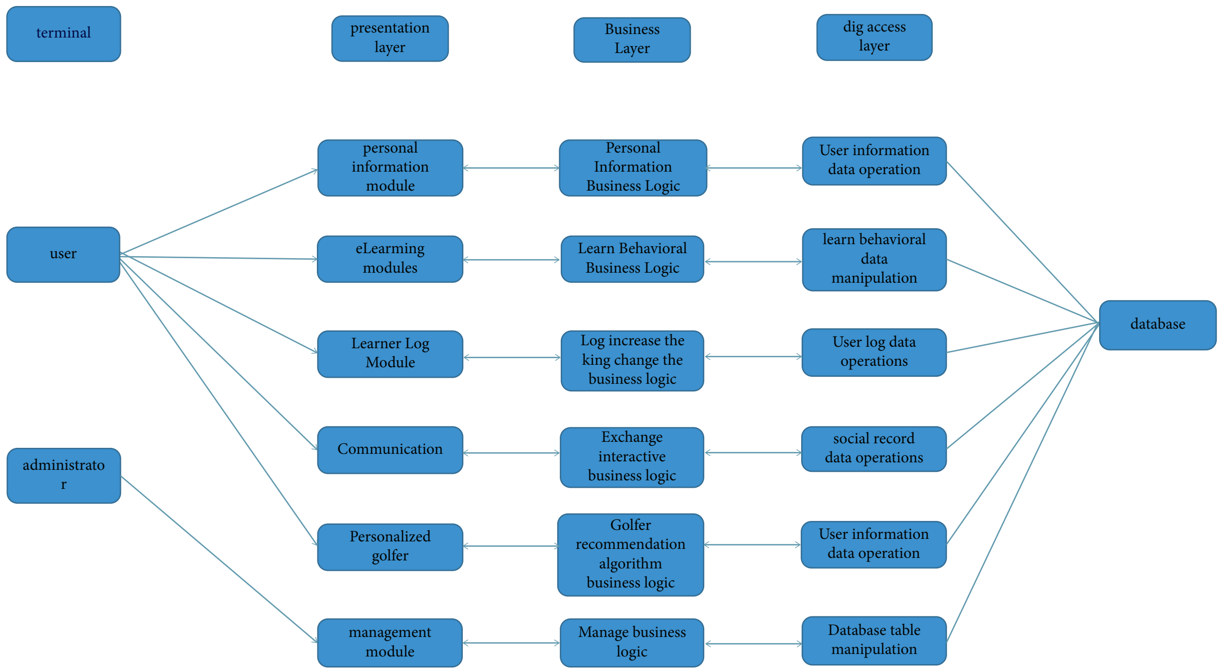

Figure 2: Platform four-tier architecture model.

presentation layer, business layer, data access layer, and database, as shown in Figure 2.

There are three main roles of mobile teaching platforms. Learner: learners can search and learn from learning resources, and can comment, score, collect, like, or share interesting learning resources. Learners can add friends to chat with friends online, exchange learning experiences, and share experiences with each other. The platform records learners' behavior logs. The platform recommends golfers for learners according to users' personal information, social behavior records, and learning behavior records. Teachers: in order to facilitate teachers to manage their teaching resources and students, the platform provides teachers with additional PC login interfaces [14]. Teacher users can upload teaching resources, manage teaching resources, and supervise students' learning on the PC. Administrators: the administrator user coordinates the overall situation, carries out platform management on the PC side, ensures the normal operation and maintenance of the server and database, and can maintain database security, modify database resources, modify user permissions, etc. The system use case is shown in Figure 3.

According to the design objectives and system use cases of this study, the functional modules of the platform are divided in detail, and the platform is roughly divided into the following six modules: resource display module, course learning module, communication and interaction module, personal center module, and personalized ball appointment module. The specific functional module division of the mobile learning platform is shown in Figure 4.

By analyzing the business needs of platform users and the feasibility of the system, the MySQL5.7.02 database is used to establish the platform database called hello Hamilton. At the same time, Navicatl0.1.7 is used to manage and operate the database for ease of operation and is also used to manage the primary foreign key relationships between tables in the database. The user model is an individual user feature extracted from the specific personality behaviors and objective attributes of learners. The user model can roughly reflect learners' behavior habits, knowledge of cognition, level, style, thinking habits, and other information. The user model based on the user information extracted by the mobile teaching platform is shown in Figure 5.

The trust score between learners cannot be obtained explicitly in the teaching platform. The intensity of information exchange and interaction between social network users can approximately reflect their trust relationship [15, 16]. Therefore, referring to the trusted sources of social networks, this study divides the trust relationship between platform learners into the following three aspects: learners trust people who have more contacts in the real world, such as relatives and friends; users have high trust in people with high prestige in the real world, such as celebrities; and users trust people who have similar social interest circles. For example, it is easier for two people in the same social interest circle to establish trust. In the real world, the trust relationship is directional and asymmetric, so this paper expands G (N, E, and W) into a directed weight graph. At this time, learners' nodes are connected through directed double lines, and their trust weights are not equal. Based on this, the directed social network map of the 020-badminton mobile teaching platform is obtained, and its schematic diagram is shown in Figure 6.

In Figure 6, the output vector of node A represents the trust weight distribution of learner a to other learners, and the input vector of A represents the trust weight of other learners to A. On this platform, the contact strength between users comes from two aspects: one is the online

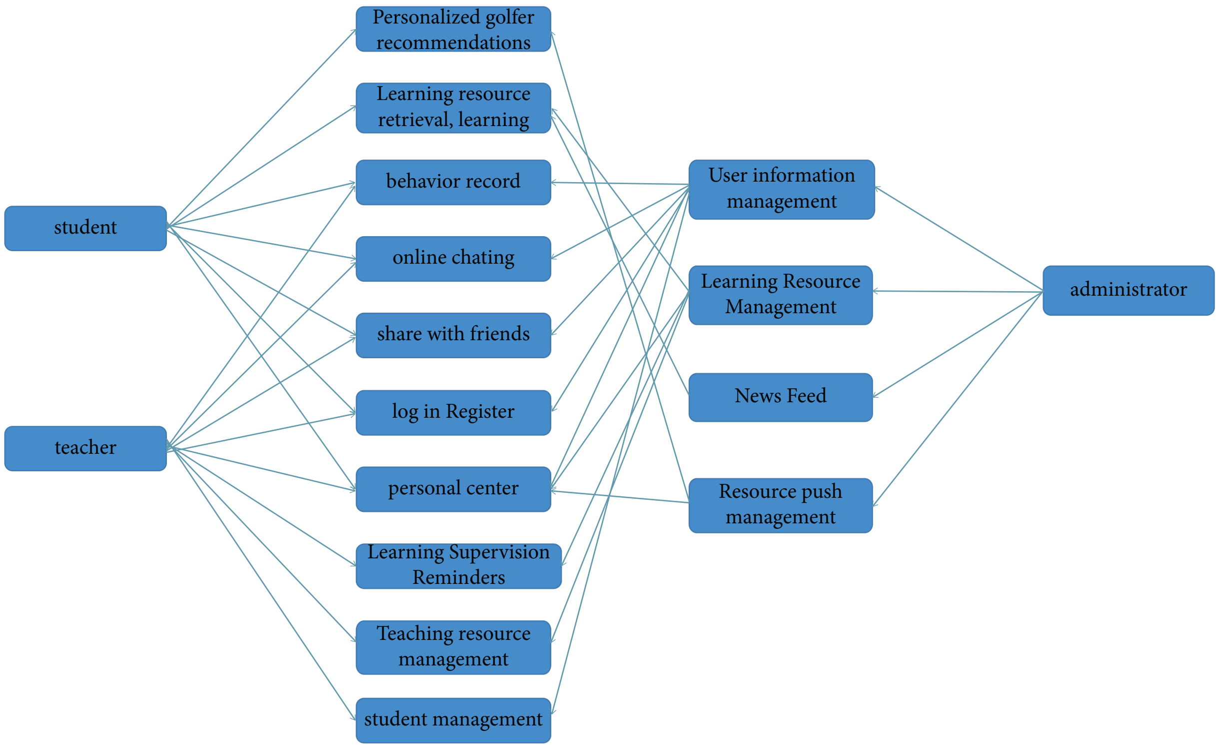

Figure 3: System use case diagram.

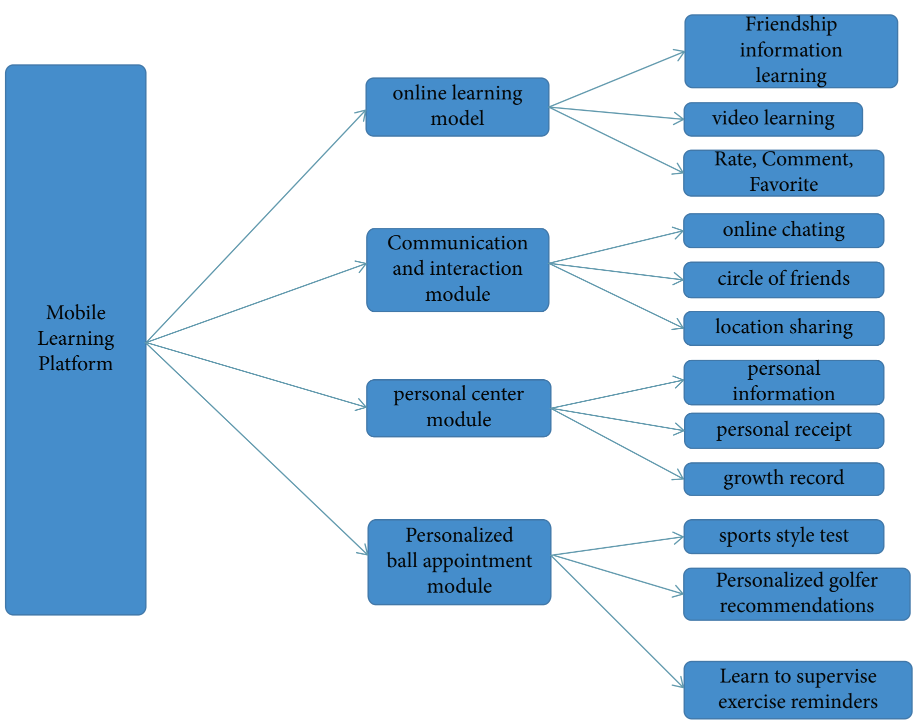

Figure 4: Platform function module design.

communication and chat records of users; and the second is the user's circle of friends interaction record.

On the teaching platform, it is not ruled out that there will be learners who have never had communication and interaction records with others. We keep these isolated nodes. Because their contact strength with any other node is 0, it will not affect the calculation results of trust, as shown in Figure 7 [17].

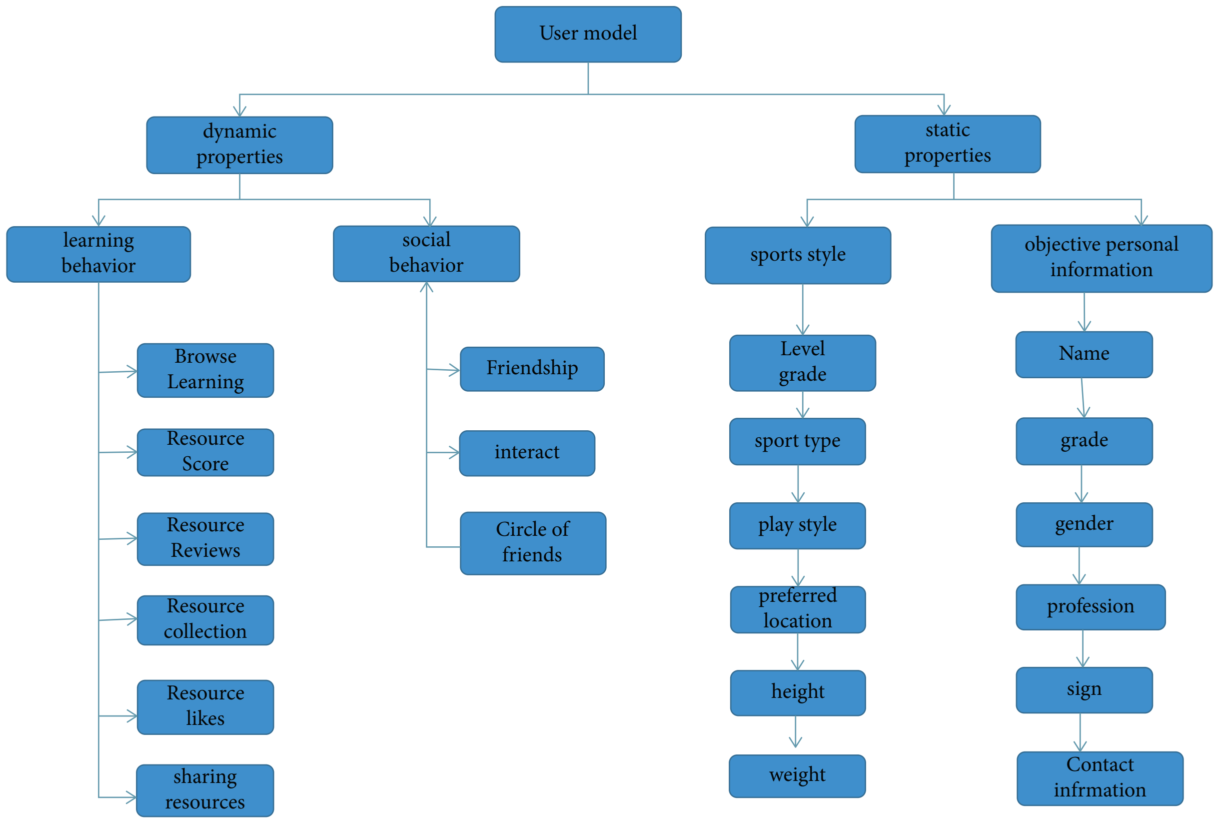

Figure 5: User model.

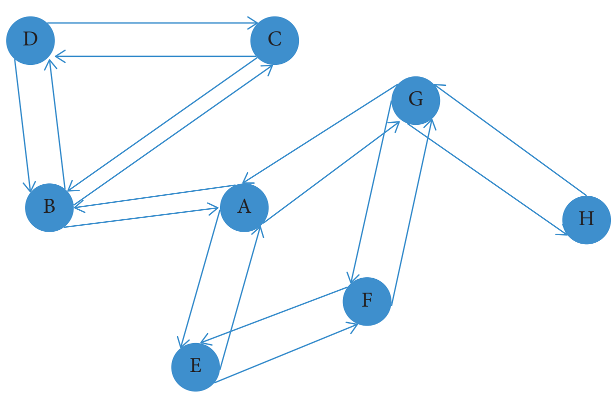

Figure 6: Learner social network map.

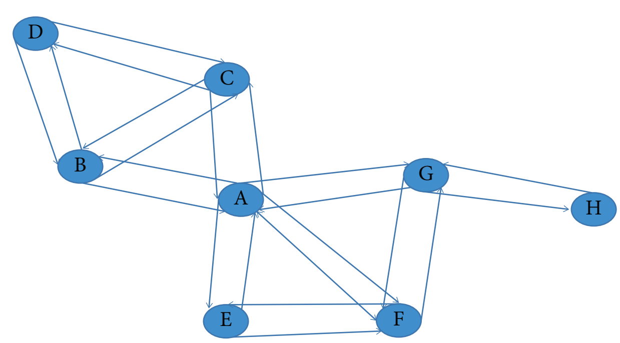

Figure 7: A-centered social network map.

In Figure 7, the following formula is used to measure the familiarity and trust between node A and its immediate neighbors, as shown in formula (1):

$$Ftr(A, n) = \frac{N(S_A, S_n)}{L_A}, \quad (1)$$

where n is one of A's friends, L_A is the sum of the social interaction information sent by a to all friends, and $N(S_A, S_n)$ is the interaction information sent by A to n. in this platform. Social behaviors include online communication, messages, pictures, voice, and location information sent by learners to their friends, and circle of friends interaction, comments on friends, as shown in formulas(2) and (3)

$$\frac{N(S_A, S_n)}{L_A}. \quad (2)$$

The calculation method is as follows:

$$\frac{N(S_A, S_n)}{L_A} = \alpha \frac{N(S_{A1}, S_{n1})}{L_{A1}} + (1 - \alpha) \frac{N(S_{A2}, S_{n2})}{L_{A2}}. \quad (3)$$

In the aforementioned formula, the first item is the trust obtained by learners' online communication behavior, and the second item is the trust obtained by the interaction behavior of the circle of friends, and α is the regulatory factor. By introducing the influence of the time factor on the calculation of familiarity trust, formula (1) can be modified to the following formula, as shown in formula (4)

$$Ftr(A, n) = \frac{N(S_A, S_n)}{L_A} * \frac{\sigma}{T_{A\leftrightarrow n}}, \tag{4}$$

where $T_{A\leftrightarrow n}$ represents the length of time in hours when A and his friend C become friends and σ is the adjustment factor. According to the aforementioned formula, mutual trust between any adjacent nodes in Figure 8 can be obtained, as displayed in Figure 8.

According to the trust propagation theory, the trust degree will be lost when passing through the intermediate node. The more intermediate nodes between the target node and a, the more serious the loss, which is also in line with our cognition in daily life. Accordingly, it is proposed that the trust degree of A to any other user in the trusted network is expressed as shown in formula (5)

$$Ftrust(A, n) = \omega_N \cdot \sum_{i=1}^{k} \left[\prod_{j=1}^{m} Ftr\left(P_{j-1}, P_j\right) \right]. \tag{5}$$

In the aforementioned formula, ω_N represents the hierarchical distance between root node A and target node n in a trusted network. Its value gradually increases with the increase in the number of layers. The calculation method of ω_N adopts the following formula:

$$\omega_N = \left(1 - \frac{layer_N}{layer_{SUM}}\right), \tag{6}$$

where $layer_{SUM}$ represents the maximum hierarchical distance of a trusted network. According to the aforementioned theoretical research, its value is 7, $layer_N$ is the hierarchical distance between the target node n and the root node, and when it is greater than 6, ω_N is 0. When sorting the trust degree of node A to other learners, if there are two learners with the same trust value, priority is given to the target node with the shortest path, the node with the least path, the weight of each side, and the largest target node. Finally, the trust ranking of node A to other nodes is: $G > F > B > H > C = E > D$, as shown in Table 1

When considering the reputation of students and the trust network, maintain the relationship of mutual trust, including the trust connection of all users, as shown in the figure 9.

The score of any node in Figure 9 depends on the scores of other nodes, and its score determines the score change of other nodes to prevent a few nodes from doing evil and modifying the score results. The calculation formula of social trust in this study is given as shown in the following formula:

$$Fsoc(i) = \frac{1}{\sum_{j\in N, j\neq A} Fsoc(j)} \sum_{j\in N, j\neq A} Fsoc(j) \times Fre(j, i). \tag{7}$$

According to our simulation experiment, the similarity of the circle of friends outside the three layers of the trusted network has basically no reference value, so this study sets

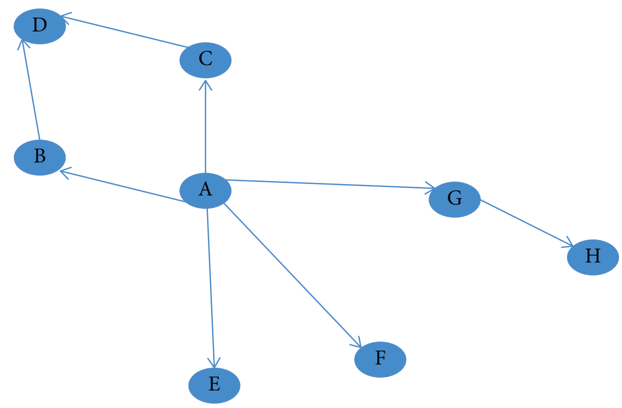

Figure 8: Trust network map centered on A.

Table 1: Ranking of trust nodes in A.

Target node	Familiarity trust value
G	0.309
F	0.240
B	0.171
H	0.103
C	0.069
E	0.069
D	0.056

the maximum number of calculation layers of group similarity as 3. This trust calculation, considering both direct and indirect circle of friends' similarity, adopts the idea of the Jaccard coefficient, as shown in formula(8):

$$STr_G(u, f) = \sum_{n=1}^{3} a_n \left| \frac{F_u^n \cap F_f^n}{F_u^n \cup F_f^n} \right|. \tag{8}$$

This study divides the trust between learners due to social behavior into three aspects: familiarity trust, social credibility, and a deep circle of friends similarity. The comprehensive trust between learners is the weighted sum of the three. The calculation method is shown in the following equation:

$$tr(A, n) = Ftrust(A, n) + Fsoc(n) + STr_G(A, n). \tag{9}$$

The overall calculation process of extracting the characteristics of learners' social attributes according to learners' social behavior to recommend potential players based on trust for learners is shown in Figure 10.

In the actual scoring process, different learners have different scoring standards for resources. For example, some learners' scores are generally high, while some learners' scores are generally low. In addition, some learning resources will get generally high or low scores due to their authority, particularity, and other factors. Therefore, adding user bias and resource bias to score prediction will make the prediction effect more accurate. The scoring prediction formula of the SVD model with bias is shown in the following equation:

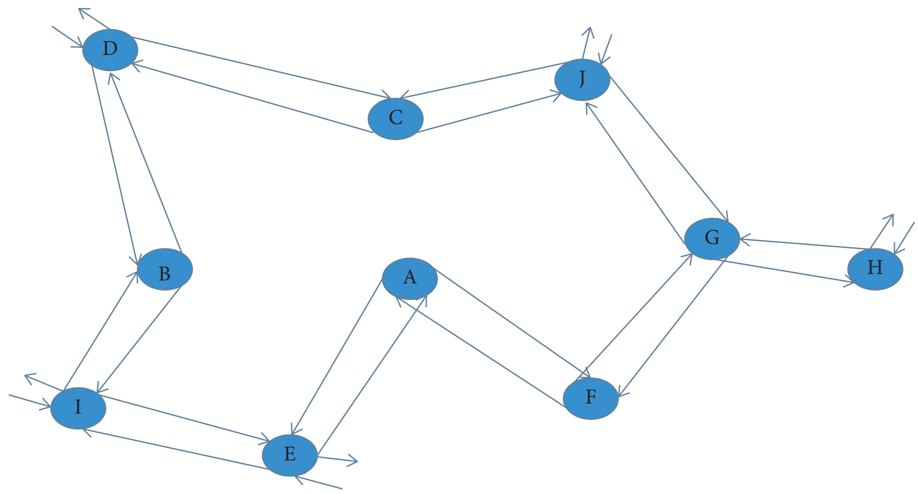

Figure 9: A schematic diagram of the trust network containing all trust contacts.

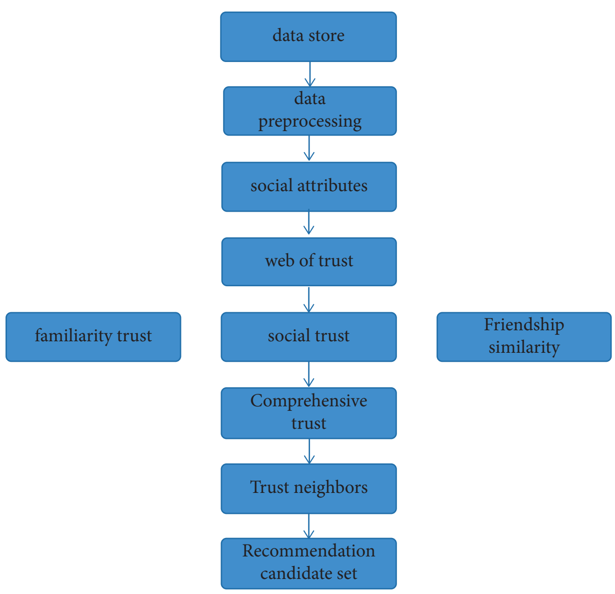

Figure 10: Learner trust calculation process.

$$f_{ui} = f\left(b_{ui} + q_i^T p_u\right), \tag{10}$$

where f_{ui} is the score prediction of learner u for resource i, and the definition of b_{ui} is shown in the following formula:

$$b_{ui} = \mu + b_u + b_i, \tag{11}$$

where μ is the global bias, that is, the average score of learners for all resources. Assuming that the known score in the user learning resource scoring matrix is r_{ui}, the error between the real value and the predicted value is shown in formula (12)

$$e_{ui} = r_{ui} - f_{ui}. \tag{12}$$

Then, the total square sum of errors can be calculated and expressed by the following formula:

$$SSE = \sum_{u,i} e_{ui}^2 = \left(r_{ui} - f_{ui}\right)^2. \tag{13}$$

The solution of the model is transformed into solving the least square problem as shown in equation (14)

$$\min_{p_*, q_*, b_*} \sum_{(u,i)\in K} \left(r_{ui} - f\left(b_{ui} + q_i^T p_u\right)\right)^2. \tag{14}$$

The SGD algorithm is the most commonly used and efficient gradient descent algorithm to solve the aforementioned problems in machine learning algorithms. The idea is to cycle in a set, select appropriate parameters for iteration, and choose a small step gradient descent each time to find the optimal solution. The formula group to be solved is shown in the following equation:

$$\begin{cases} b_u = b_u + \gamma \cdot \left(e_{ui} - \lambda_i b_u\right), \\ b_i = b_i + \gamma \cdot \left(e_{ui} - \lambda_2 b_i\right), \\ q_i = q_i + \gamma \cdot \left(e_{ui} p_u - \lambda_3 b_i\right), \\ p_u = p_u + \gamma \cdot \left(e_{ui} p_u - \lambda_4 p_u\right). \end{cases} \tag{15}$$

In the process of data training, a better training effect can be achieved by adjusting γ and λ.

4. Experiment and Analysis

Based on the MVP theory design mode, this study uses multimedia teaching means to integrate theory, purpose, and empirical research. This paper divides the teaching design into three modules: students' learning interest, learning will, and learning achievement. In each module, it is divided into several strategies. Learning interest is divided into the following categories: interest, curiosity, purpose, and value. In learning will, it is divided into factors affecting behavior planning and self-development. In academic achievement, it is divided into the presentation of academic achievement and feedback analysis [18]. Through comprehensive and systematic design, the integration of teaching

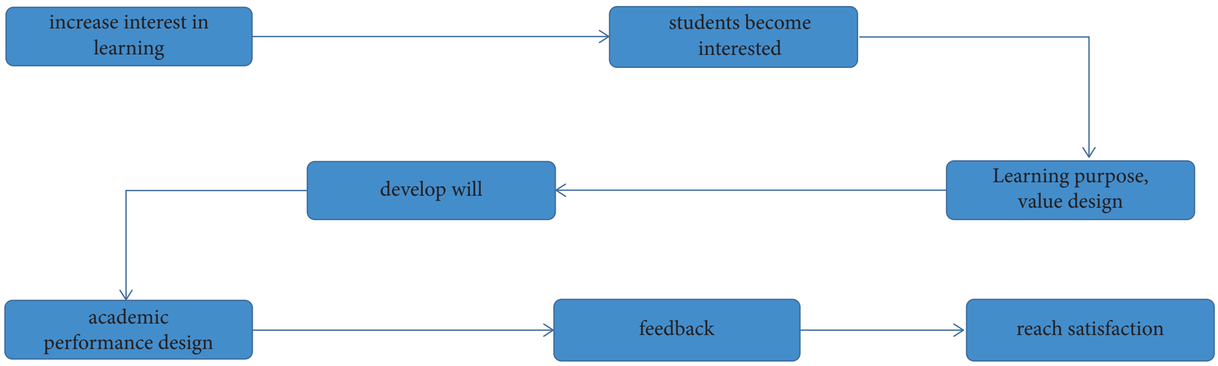

Figure 11: Process design flow.

ideas is clear, teaching experiments are optimized, students' learning efficiency is improved, and a positive and beneficial attempt is provided for the application of MVP in multimedia hurdle teaching [19].

The design of the experimental process determines whether the teaching goal can be realized. This study focuses on the role of teaching in hurdle teaching and integrates the MVP theory into design teaching. The specific implementation steps in the experimental group are shown in Figure 11.

The design of motivation in multimedia instructional design is based on the MVP theory. First, interest and curiosity learning interest can be divided into personal interest and situational interest. Situational interest refers to a short-term response to a certain situation [20]. Second, purposeful and valuable training can create a good psychological presupposition for completing the training task, which is the guarantee of learning. The purpose of training should be decentralized to each class, and the specific tasks, how many times to do them, and to what extent should be clearly specified. This can help avoid losing direction due to long-term training. Students are only interested in attractive or useful content. When they are exposed to new technologies, they often think what is the use of this? In this regard, in order to make students like the training course and believe that it is closely related to their future life, we should first connect students' needs and learning interests with learning objectives and learning content [21]. The design of a will in a multimedia learning environment has two factors that affect the cultivation of will, the first is implementation, and the second is self-management. Implementation refers to the factors that affect the implementation of the plan, mainly the impact of the external environment. Self-management factors are the factors that affect the support and development of self-management actions. It is the key to fully mobilizing students' time and initiative. Teaching should scientifically use management methods to carry out a series of activities such as students' self-control, introspection, self-knowledge, and self-study, so as to cultivate students' abilities of anti-interference, emotion regulation, cognition, and behavior control, and finally achieve the learning goal. Succeeding in a multimedia learning environment requires attention to the knowledge processes that take place in the course. Student recognition, achievement, and understanding of knowledge are also designed to improve student attitudes toward self-care and assessment, which have a significant impact on how knowledge is accomplished [22, 23]. The second, reactive alcohol, is about how to control emotions and measure outcomes. This is an important part of the feedback and also requires teachers to help students learn to think critically and generate interest, thereby developing a change in students' thinking style so that students know what it is and why it is during the training process [24].

We then divide them into an experimental group and a control group, and the two groups will make monthly test reports after finding a simple problem, which can meet the needs of the experiment. Prior to the experiment, the strengths of the two groups of students were tested and data was generated. During the experiment, the teacher is the same person, and the level of guidance is the same, which can effectively control the experiment, and there is no big difference. After the experiment, the basic qualities are tested and compared, and the academic achievements of the two groups are compared and analyzed, so as to improve the learning effect of students in all aspects as far as possible.

(A) Before the experiment, the two classes were tested for basic level (pretest). (B) The experimental class adopts the multimedia teaching method, while the control class still adopts the traditional teaching method. The teaching content is the teaching of the complete technology of track and field hurdles. (C) The questionnaire is distributed once a week. The data of the two classes are compared and analyzed with a t-test to understand the changes in students' learning motivation and training will. (D) After the hurdling technique training, make measurements and measurement models, and then test the analysis, evaluation, problem-solving ability, and thinking ability of the students in the two classes (after the test). Teachers with many years of teaching and school-running experience in our school's teaching and research center are responsible for testing to meet the measurement standards. The classroom teaching ability is evaluated by the researcher himself and scored according to the scoring rules of the latest "syllabus of Guangdong Institute of Technology."

According to the data analysis results in Table 2, there was no statistically significant difference between the students' learning satisfaction in the laboratory and the control room before the experiment ($P > 0.05$). After one week of

TABLE 2: Statistical results of students' learning interest comparison between the experimental group and the control group ($N = 100$).

Time slot	Experimental group ($x \pm s$)	Control group ($x \pm s$)	T	P
Before experiment	3.25 ± 0.20	3.26 ± 0.21	0.621	>0.05
Week 1	3.55 ± 0.23	3.45 ± 0.22	0.220	>0.05
Week 2	3.88 ± 0.23	3.60 ± 0.18	−0.325	<0.05
Week 3	3.96 ± 0.18	3.72 ± 0.17	−0.212	<0.05
Week 4	4.03 ± 0.19	3.78 ± 0.22	−0.656	<0.05
After the experiment	4.04 ± 0.15	3.77 ± 0.18.	−0.776	<0.05

asynchronous instruction in the laboratory and regular instruction in the control room, student satisfaction scores for both classes were calculated, and the time was assessed from the questionnaire. After the test, there was a significant difference between the two classes. In the second week of the asynchronous teaching method, the students' learning interests in the experimental class were higher than those in the control class ($P < 0.05$). The same difference was observed at 3, 4, and 1 week after the experiment ($P < 0.05$), as shown in Table 2.

It can be seen from the graph that the average learning interest of the students in the experimental group began to rise after the beginning of class, while the control group also improved to a certain extent, but the change was not great. By the third and fourth week, even after the end of the experiment, the follow-up survey found the same results. It fully shows that through multimedia teaching, students' interest in hurdles becomes stronger than that of traditional teaching methods, and the purpose becomes more clear. It shows that the control group is worse than the experimental group in improving and maintaining students' learning interests, as shown in Figure 12.

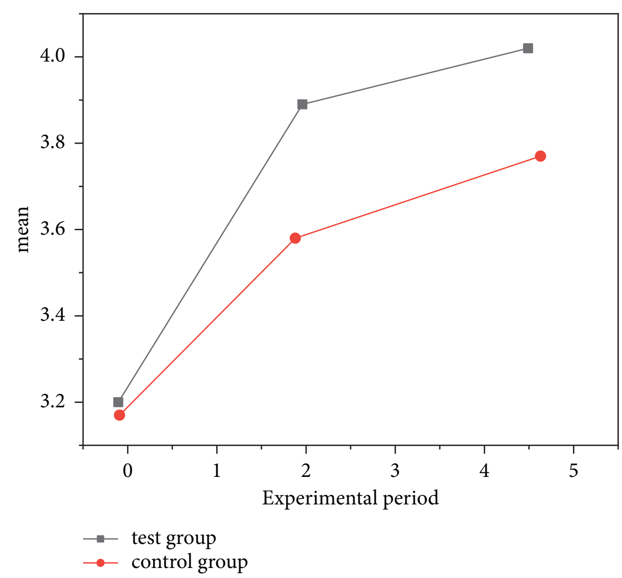

FIGURE 12: Comparison of the average change in students' learning interest between the experimental class and the control class.

The following experimental data show that multimedia teaching uses the "video incentive" of authoritative people to arouse students' attention to training and encourage students to adhere to learning. It also help students to overcome their own inertia and other internal and external factors, and finally achieve the learning goal [25, 26]. Before the experiment, the will of the experimental group was 3.55 ± 0.22 and that of the control group was 3.53 ± 0.31. No significant difference was observed. In the second week, the mean of the test group was 3.86 ± 0.23 and the mean of the control group was 3.68 ± 0.18. The difference between the two groups was 0.318, $P < 0.05$. The academic performance of the two groups differed considerably. The academic satisfaction of the students in the control group increased only slightly, while the academic satisfaction of the experimental group increased, indicating that multimedia teaching has remarkable results. The data showed that the experimental group and the control group were 4.04 ± 0.15 and 3.62 ± 0.18, respectively, $P < 0.05$. This shows that the team is working hard to go beyond the board of willpower training, as shown in Table 3.

As can be seen from the figure below, the learning will of the experimental group gradually increased with the deepening of learning hurdle technology, while that of the control group reached its peak in the third week and then decreased. It shows that the cultivation of learning will in the experimental group is significantly better than that in the control group, and the learning will directly affect the training results. Therefore, it can be concluded that the cultivation of learning will is very important in hurdle teaching, as shown in Figure 13.

The teaching evaluation of the experiment is explained by comparing the hurdle performance of the two groups. This study selects two indicators: technical evaluation performance and time utilization [27]. The technical evaluation results are obtained by integrating the technical action quality, action performance, and speed. Time usage is also measured simultaneously by using electronic clocks and watches to ensure time accuracy and is used as a quantitative indicator of an obstacle course. The higher the timing level (the lower the score), the faster the obstacle and the higher the skill. Time utilization can make up for the lack of teachers' subjective evaluation and scoring and can make the hurdle performance objective and reliable [28, 29]. It can be seen that the test scores of the experimental group students in the laboratory are 89.28 ± 4.36, which is higher than that of the control group's 80.64 ± 6.22; the time-consuming value of 18.8 ± 0.06 is lower than the control class's 24.3 ± 0.10, indicating that the total skills of the laboratory students are high in the control class. After the experiment, there was a difference between the two groups ($P < 0.05$). The results are shown in Table 4.

The average score in the examination room was 89.28, and in the control room it was 80.64. At the same time, the differential structure was also lower than that of the control

Table 3: Statistical results of students' will comparison between the experimental group and the control group ($N = 100$).

Time slot	Experimental group ($x \pm s$)	Control group ($x \pm s$)	T	P
Before experiment	3.55 ± 0.20	3.53 ± 0.21	0.610	>0.05
Week 1	3.60 ± 0.21	3.61 ± 0.20	0.234	>0.05
Week 2	3.86 ± 0.23	3.68 ± 0.18	−0.308	<0.05
Week 3	3.93 ± 0.18	3.70 ± 0.17	−0.235	<0.05
Week 4	4.02 ± 0.19	3.65 ± 0.22	−0.766	<0.05
After the experiment	4.04 ± 0.15	3.62 ± 0.18	−0.858	<0.05

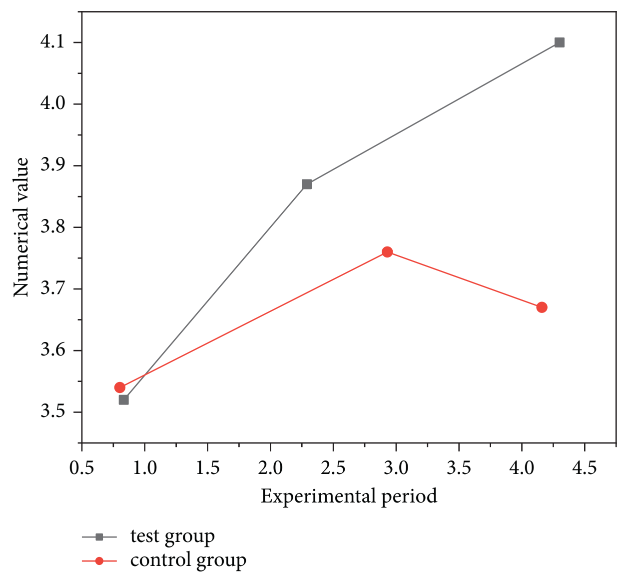

Figure 13: Comparison of the average change in students' learning will between the experimental class and the control class.

Table 4: Research on multimedia-assisted teaching of hurdle technology based on MVP theory.

Project	Experimental group ($x \pm s$)	Control group ($x \pm s$)	T	P
Technical evaluation score (points)	89.28 ± 4.36	80.64 ± 6.22	−1.625	<0.05
Utilization time (%)	18.8 ± 0.06	24.3 ± 0.10	−0.822	<0.05

room. The difference of the lower sample indicates that the distribution of the sample data is small and close to the overall average; that is, the assessment score of the class is the most important, and there are significant differences between different models. Two grades (P0.05).

5. Conclusion

The experimental results show that multimedia teaching created from the perspective of MVP can achieve the purpose of promoting students' physical and mental health in difficult courses. Not only do students enjoy learning, gain strong training, and excel academically, but they also learn to identify their strengths and weaknesses, identify causes, and offer solutions. Traditional problem-solving teaching can improve students' learning fun at the beginning of the class, but with the increase of difficulty, students' learning interest gradually declines in learning. The teachers do not pay attention to the encouragement and ideological training in the teaching process, and the students' training will also be shaken to a certain extent. They think that hurdles are too difficult and difficult to learn, or they have a fear and dare not cross hurdles, so they cannot stick to them, and this reduces their confidence in learning hurdles. It also further leads to unsatisfactory training results. After the course, teachers do not take the initiative to provide psychological counseling for students and guide reflection. Some students with unsatisfactory results will have negative emotions and are not satisfied with the results. Because we cannot concentrate in class and have a deep understanding of hurdle knowledge, we cannot analyze our own advantages and disadvantages and improvement methods. It can be judged that the overall effect of multimedia teaching is better than traditional teaching. The teaching design using the MVP theory is clear and easy to implement, as can be seen from the experimental results. Multimedia teaching helps to improve students' technical level, cultivate skills and abilities, stimulate strong will, give full play to the subjective initiative, and achieve the purpose of physical and mental health.

Data Availability

No data were used to support this study.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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References

[1] S. Ivanaj, G. B. NganminiNganmini, and A. Antoine, "Measuring E-learners' perceptions of service quality," *Journal of Organizational and End User Computing*, vol. 31, no. 2, pp. 83–104, 2019.

[2] K. Y. Chau, K. M. Y. LawLaw, and Y. M. Tang, "Impact of self-directed learning and educational technology readiness on synchronous E-learning," *Journal of Organizational and End User Computing*, vol. 33, no. 6, pp. 1–20, 2021.

[3] H. Yu, "Application analysis of new internet multimedia technology in optimizing the ideological and political education system of college students," *Wireless Communications and Mobile Computing*, vol. 2021, no. 4, 12 pages, Article ID 5557343, 2021.

[4] F. Sang and Y. Xu, "Research on the current situation and improvement strategies of aesthetic education in music classrooms in primary and secondary schools in China," *Modern Economics & Management Forum*, vol. 3, no. 1, pp. 14–19, 2022.

[5] C. Kairu, "Augmented reality and its influence on cognitive thinking in learning," *American Journal of Educational Research*, vol. 9, no. 8, pp. 504–512, 2021.

[6] S. Li, "Structure optimization of e-commerce platform based on artificial intelligence and blockchain technology," *Wireless Communications and Mobile Computing*, vol. 2020, no. 12, 8 pages, Article ID 8825825, 2020.

[7] W. Li, "Multimedia teaching of college musical education based on deep learning," *Mobile Information Systems*, vol. 2021, no. 2, 10 pages, Article ID 5545470, 2021.

[8] S. A. Khozaei, N. V. Zare, H. K. Moneghi, T. Sadeghi, and M. M. Taraghdar, "Effects of quantum-learning and conventional teaching methods on learning achievement, motivation to learn, and retention among nursing students during critical care nursing education," *Smart Learning Environments*, vol. 9, no. 1, pp. 18–11, 2022.

[9] D. Thurm and B. Barzel, "Teaching mathematics with technology: a multidimensional analysis of teacher beliefs," *Educational Studies in Mathematics*, vol. 109, no. 1, pp. 41–63, 2022.

[10] W. Li, "A study on the construction of morality internalization of young teachers in colleges and universities," *Journal of Higher Education Research*, vol. 3, no. 1, pp. 43–46, 2022.

[11] Y. Li, "Classroom interaction — different turn designs of question and evaluation of teacher's talk," *Journal of Higher Education Research*, vol. 3, no. 1, pp. 39–42, 2022.

[12] P. Cheng, L. Yang, T. Niu, and B. Li, "On the ideological and political education of material specialty courses under the background of the internet," *Journal of Higher Education Research*, vol. 3, no. 1, pp. 79–82, 2022.

[13] C. Tan, "Using technology to support authentic learning approach in social studies education: a learning design for a social studies subject," *Journal of Higher Education Research*, vol. 3, no. 1, pp. 69–75, 2022.

[14] X. Wu, "Research on the reform of ideological and political teaching evaluation method of college English course based on "online and offline" teaching," *Journal of Higher Education Research*, vol. 3, no. 1, pp. 87–90, 2022.

[15] J. Martikainen, A. Hujala, and S. Laulainen, "Embodied reflection of images as an arts-based research method: teaching experiment in higher education," *Interchange*, vol. 53, no. 1, pp. 75–97, 2021.

[16] Y. Zhu, S. Liang, X. Wu, and H. Yang, "A random finite set based joint probabilistic data association filter with non-homogeneous Markov chain," *Frontiers of Information Technology & Electronic Engineering*, vol. 22, no. 8, pp. 1114–1126, 2021.

[17] J. Qu, "Research on mobile learning in a teaching information service system based on a big data driven environment," *Education and Information Technologies*, vol. 26, no. 5, pp. 6183–6201, 2021.

[18] N. Martin and F. Smarandache, "Decision making on teachers' adaptation to cybergogy in saturated interval- valued refined neutrosophic overset/underset/offset environment," *International Journal of Neutrosophic Science*, vol. 12, no. 2, pp. 58–70, 2020.

[19] M. G. Di Gesú, "Building intersubjectivity in online learning: pupils' and university students' perception of teachers' social presence in technology-mediated teaching and learning processes," *Human Arenas*, vol. 4, no. 2, pp. 338–349, 2021.

[20] H. Yildiz DurakYildiz Durak, "Preparing pre-service teachers to integrate teaching technologies into their classrooms: examining the effects of teaching environments based on open-ended, hands-on and authentic tasks," *Education and Information Technologies*, vol. 26, no. 5, pp. 5365–5387, 2021.

[21] B. Beschorner, "Revisiting kuo and belland's exploratory study of undergraduate students' perceptions of online learning: minority students in continuing education," *Educational Technology Research & Development*, vol. 69, no. 1, pp. 47–50, 2020.

[22] M. Gallagher, M. Breines, and M. Blaney, "Ontological transparency, (in)visibility, and hidden curricula: critical pedagogy amidst contentious edtech," *Postdigital Science and Education*, vol. 3, no. 2, pp. 425–443, 2020.

[23] K. Lu, "Experimental research of English teaching management model based on personalized multimedia technology," *OALib*, vol. 07, no. 04, pp. 1–13, 2020.

[24] S. Qi, S. Li, and J. Zhang, "Designing a teaching assistant system for physical education using web technology," *Mobile Information Systems*, vol. 2021, no. 6, 11 pages, Article ID 2301411, 2021.

[25] J. Xu and T. Li, "The application of artificial intelligence and virtual reality in the auxiliary teaching of american science fiction literature," *Journal of Intelligent and Fuzzy Systems*, vol. 2021, no. 6, 10 pages, Article ID 219146, 2021.

[26] Z. M. He, L. Peng, H. Y. Han, H. Lu, Z. F. Wang, and P. Zhao, "Research on indoor and outdoor comprehensive positioning technology based on multi-source information assistance," *Procedia Computer Science*, vol. 166, pp. 361–365, 2020.
[27] D. Wang, C. Yu, L. Meng et al., "Study on forming sequences of the auxiliary roll height in flexible asymmetric rolling process," *International Journal of Advanced Manufacturing Technology*, vol. 106, no. 3-4, pp. 1375–1384, 2020.
[28] Q. J. Li, R. R. Wu, and Y. Ng, "Developing culturally effective strategies for Chinese to English geotourism translation by corpus-based interdisciplinary translation analysis," *Geoheritage*, vol. 14, no. 1, pp. 6–24, 2022.
[29] L. S. Vasilevskaya and N. A. Volgin, "Application of non-contact methods for improved visual inspection of the technical condition of hydraulic structures," *Power Technology and Engineering*, vol. 55, no. 4, pp. 528–533, 2021.