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Analysis of the Application of Modern Information and Education Technology in Teaching

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Abstract

Research on the application of modern information and education technology in teaching is to improve the efficiency of teachers' lesson preparation. In this paper, we first construct a multimedia teaching model to clarify the research idea, improve the average efficiency of teachers' network use time with multimedia teaching form modeling algorithm, eliminate the time coupling of random variables with random problem decomposition algorithm in multimedia teaching, and conduct a multimedia teaching system compatibility test to detect whether the network signal can maintain stability during the teaching process so that online decision making remains optimal in each time period. The data show that 20.86% and 21.60% of the students have clear knowledge of the teaching content and teaching objectives, 44% and 50% are very satisfied with the evaluation indexes of teaching principles in T3 and T4, and 56% are very satisfied with the motivation inspiration. This topic helps to move modern educational technology from the theoretical level to practice from teaching practice.

Keywords: *information and education technology, multimedia teaching, instructional design, teaching system compatibility*

Introduction

In the modern social conditions where information technology is becoming more and more developed Internet technology and other multimedia is constantly popular and updated, people pay more and more attention to the application of modern educational technology in teaching (I., 2019).

Information technology is increasingly applied to the process of subject teaching practice, which greatly promotes the significant changes in the teaching of physical courses.

In the context of the new curriculum reform, the advantages of modern information technology should be given full play in order to improve students' subject learning ability(He, Wu, Sun, & Xu, 2020; Probine & Perry, 2021).

The implementation of subject core literacy is an inevitable demand of the development of the

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times and an urgent need for curriculum reform (Lambert, Alfrey, O'Connor, & Penney, 2021). With the implementation and steady progress of the new curriculum reform, the application of modern information technology in the teaching classroom is a requirement of the curriculum standards and an effective way to achieve the improvement of education and teaching in the new situation. This is not only reflected in the hardware support provided by modern information technology for improving teaching quality and changing teaching methods, but also in making significant changes in the learning content of the curriculum and teachers' educational and teaching concepts, behaviors, etc. (S., 2022).

The use of modern information technology in the classroom, access to relevant Internet teaching resources, the construction of student-oriented independent learning mode; the use of modern information technology in the classroom, according to the material, the construction of individualized tracking practice teaching mode, has become a major driving force to promote the reform of education and teaching, can be in the new curriculum reform, better strengthen the students' subject matter literacy. To adapt to the reform and development of education in the information age, the concepts, theories, methods and approaches in the field of education have been constantly updated, and a new discipline, educational technology, has been born.

The literature (Ma, Li, & Su, 2013) points to an ICT, or Information Communication Technology in Schools, campaign in Ireland. In response to the needs of teachers, students and parents, and with the aim of developing digital educational content, the government established the Socialnet online repository for sharing teaching and learning data.

The literature (Hong, Xuefei, & Caiyun, 2022) points out that resource sharing has an important role in distance education, helping teachers to concretize abstract knowledge and giving students a more intuitive experience, thus motivating them to learn actively. Its technical characteristics are reflected in digitalization, technology and multimedia, with the aim of achieving open and shared quality teaching resources.

The literature (Kubrický & Částková, 2015) promotes the development of modern education with educational informatization, and changes the obsolete teaching mode with modern technology puts forward new requirements for teachers' online teaching ability.

The literature (Ren, 2020) explored the university English teaching mode as a research object and found that the use of modern technological achievements can improve teaching effectiveness.

Based on this, the literature (Whiteley, 2012) proposed teaching big concepts, which are building blocks of understanding and can be considered as meaningful patterns used to enable the connection of other fragmented knowledge points.

The literature (Chalmers & Nason, 2017; Onofrei & Iancu, 2015) argues that the entire curriculum design presents a network of systems, each of which also includes subsystems that work together to ultimately point to the STEM big concepts.

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Sinead Walker, a scholar at Ohio State University, proposed a "linear chain model" to guide the curriculum design with the big concepts.

The term educational technology officially appeared in the 1970s, and it is a new discipline of education that gradually developed on the basis of audiovisual teaching, procedural teaching and system design science. Educational technology is a theoretical and practical technology based on modern educational theory, using modern technological achievements and system science to improve teaching effectiveness and optimize the teaching process.

It solves teaching problems by studying the learning process and learning resources, i.e. solving the problems of "how to teach" and "how to teach well". From the perspective of the formation and development process of educational technology, due to the different sequences of the presentation of "technology" and the continuous expansion of the scope of the discipline itself, different definitions of educational technology have emerged in different historical periods.

Initially, the term "educational technology" was used with emphasis on the application of physical technology, and with the development of physical technology came the problem of creating and developing software in conjunction with hardware technology, which at that time consisted of hardware and software such as television, film, projection, and computers (Y. Li, 2021).

This paper mainly analyzes the application of modern information education technology in teaching, firstly builds a multimedia teaching model, studies the feasibility of improving the average efficiency of teachers' network usage time through multimedia teaching form modeling algorithm, eliminates the time coupling of random variables with multimedia teaching stochastic problem decomposition algorithm, and then obtains the data required for this research and analyzes it.

Finally, the final conclusion of this paper is drawn by analyzing the current situation of the application of modern information and education technology in teaching and learning and the principles of curriculum development.

Multimedia Information Teaching Technology

Distributed multimedia teaching model

Teachers using multimedia for teaching can present pictures, text and sound together. Advantages of multimedia teaching system.

From the viewpoint of teaching law, distributed multimedia teaching system overcomes the defects of traditional teaching knowledge structure due to the use of hypertext structure, and has the characteristics of presenting information in multiple forms of non-linear mesh structure, which is in line with the law of educational understanding (W. Li & Fan, 2021).

The design process of multimedia technology teaching is shown in Figure 1.

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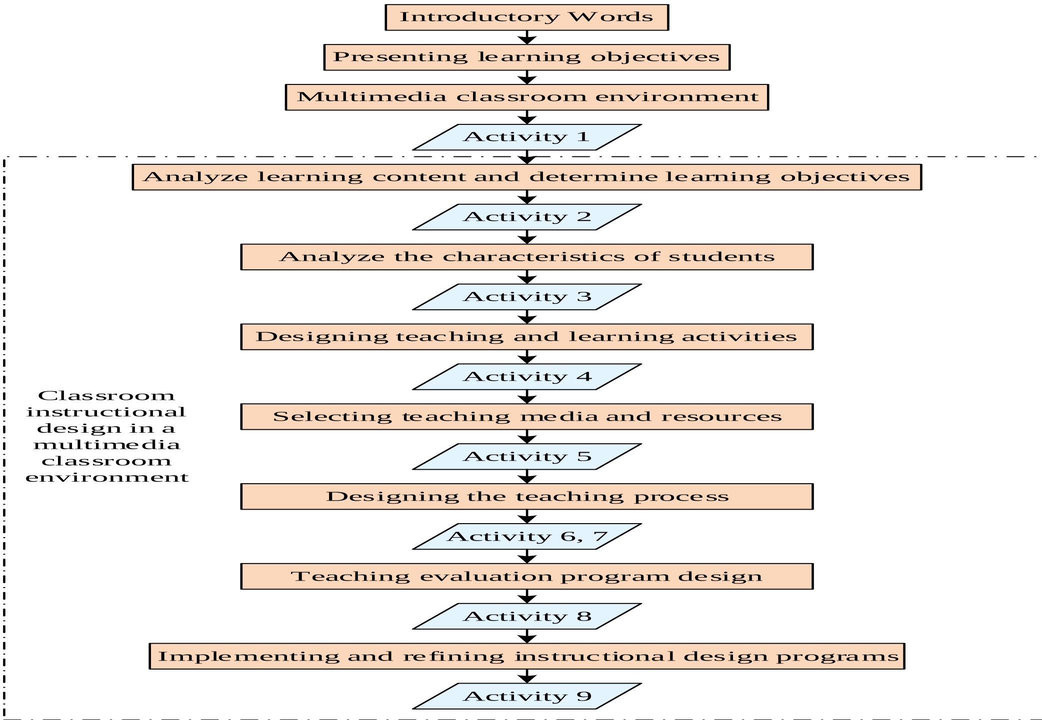

Figure 1: Multimedia Technology Teaching Design Process

Multimedia teaching problem form modeling

Assume that user i is all associated with a -utility function $U_i\left(\sum_{j\in P_i(t)} b_{ij}(t)\right)$, which represents the benefits of receiving data at a rate of $\sum_{j\in P_i(t)} b_{ij}(t)$ from the data provider. Typically, these gains can be the user's quality of service/experience. To ensure the existence and uniqueness of the solution to the transmission control problem, the following assumptions are made in this paper for the form of $U_i(.)$.

Let $i \in £ , U_i(.)$ be a concave function that is monotonically increasing for all 1 and is continuously derivable to the second order.

Let 2: $U_i(.)$ both satisfy the Lipschitz condition, i.e., $\forall x, y, \nabla U_i(x) - \nabla U_i(y) \leq G\|x-y\|m$, G are constants.

The above assumptions guarantee the existence of the optimal value of $U_i(.)$ and the smoothness of the function, so that this optimal value can be obtained by convergence of the descent method. Several functions such as the utility functions in the literature satisfy the above assumptions. Define vector $b_i(t) @\left[b_{ij}(t),\ j \in P_i(t)\right]$ and its 1-paradigm $|b_i(t)| = \sum_{j\in P_i(t)} b_{ij}(t)$, so that the long-term time-averaged utility of user i can be expressed as:

$$\bar{U}_i @\limsup_{T\to\infty} \frac{1}{T}\sum_{t=1}^{T} U_i\left(\left|b_i(t)\right|\right) \quad (1)$$

The objective of the algorithm proposed in this chapter is to maximize the time-averaged utility of all users in the network, i.e., $\sum_{i\in C} \bar{U}_i$, subject to the constraints of network capacity and queue stability. Therefore, the transmission control of ICNs in mobile scenarios can be formulated as the following stochastic optimization problem:

$$Maximize \sum_{i\in £} \bar{U}_i \quad (2)$$

$$\text{Subject to} \frac{1}{t}\limsup_{T\to\infty}\sum_{t=1}^{T}\sum_{i\in s_l(t)}\sum_{j\in P_{i,l}(t)} b_{ij}(t) \le \bar{c}_l, \forall l \quad (3)$$

$$Q_{ij}(t)\text{Stable}, \forall i \in £,\ j \in P_i(t) \quad (4)$$

$$b_{ij}(t) \in \left[0, \lambda_{ij}(t)\alpha_i(t) + Q_{ij}(t)\right], \forall t, i, j \quad (5)$$

$$\sum_{j\in P_i(t)} \lambda_{ij}(t) = 1, \forall t, i, j \quad (6)$$

where vector $s_l(t)$ represents the set of users requesting data over link l, and $P_{i,l}(t)$ represents the content providers in $P_i(t)$ that use link l to transmit data.

Constraint (3) limits the time-averaged transmission rate through link l to be no greater than the average capacity $\bar{c}_l$ of l. Note that unlike wired networks with static link capacity, constraint (3) indicates that the data transmission rate is not required to satisfy the capacity limit at all times in mobile scenarios. On the contrary, data rates obtained through controls that exceed the average link capacity for a limited time interval are tolerable because the instantaneous capacity of the wireless link may change after the transmission policy is determined. However, to ensure congestion avoidance, the data rate is limited in time average to the average bandwidth of the link so that the link is not congested.

To explain how the link restriction condition (3) avoids link congestion, first introduce the following virtual queue $H_l(t)$ for each link l:

$$H_l(t+1) = \left\lceil H_l(t) + g_l(t) \right\rceil^{+}, \forall l \in \mathrm{E} \quad (7)$$

where $g_l(t) @ \sum_{i \in s_l(t)} \sum_{j \in P_{i,l}(t)} b_{ij}(t) - c_l(t)$. According to (7), $H_l(t)$ can be viewed as a buildup of data waiting to be sent on the t time slot link l. This buildup rises as the data arrival rate exceeds the link capacity. Given $H_l(1) = 0$, there is $H_l(t)/t \geq 1/t \sum_{\tau=1}^{t} g_l(\tau)$. This shows that (3) is satisfied when $H_l(1)$ is stable. Therefore, there exists a non-negative integer F with $\mathrm{E}\{H_l(t)\} > F$ the probability of converging to 0. That is, l provided a suitable sending queue is set, then the probability of data loss due to queue overflow converges to 0, so (3) avoids network congestion.

In addition, the problem can still be introduced in the form of its probability distribution for packet loss due to channel errors. For example, assuming that the channel error probability is p, it is sufficient to modify the c_l in the right-hand side of (3) to $(1-p)\overline{c}_l$.

Multimedia data transmission patterns in ICNs for mobile scenarios:

(1) At the path cache, data requester E sends a request for /V1 and sends it through switch B to mobile device G. B actively caches this data when /V1 returns.

(2) Multiplexing, due to the existence of multiple copies of /V1, ICN switch A sends requests for /V1 and /V2 from D to content providers B and G, respectively. caching /V1 at B instead of further away at D shortens the transmission distance and reduces the data /V1 acquisition delay. The ICN multimedia data transmission in the mobile scenario is shown in Figure 2.

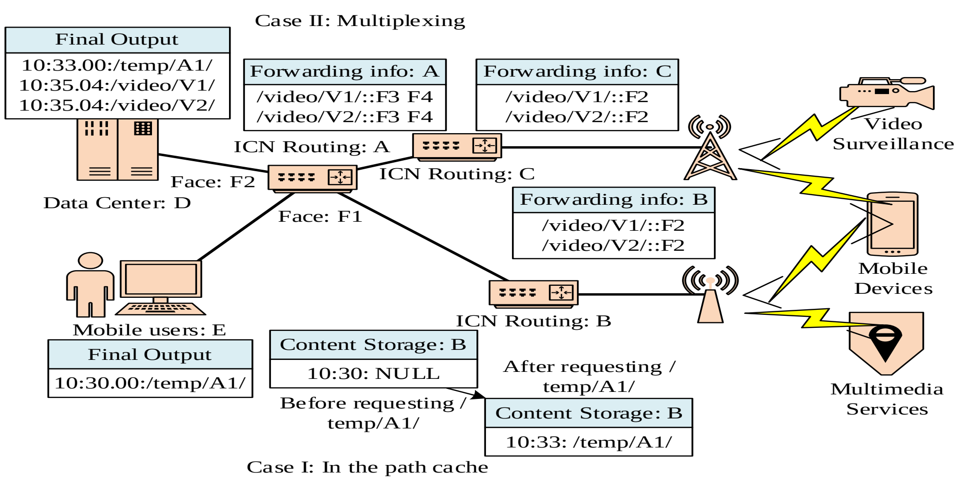

Figure 2: ICN Multimedia Data Transmission in Mobile Scenario

Randomized problem decomposition algorithm in multimedia teaching

In order to eliminate the temporal coupling of random variables and to keep the online decisions optimal for each time period, this chapter establishes the min-drift-minus-penalty expression for the stochastic problem. The form of the Lyapunov function for the queue in this problem is first given:

$$L(t) @ \frac{1}{2}\sum_{l\in L} H_l(t)^2 + \frac{1}{2}\sum_{i\in £}\sum_{j\in P_i(t)} Q_{ij}(t)^2 \quad (8)$$

Let $\Delta L(t) = L(t+1) - L(t)$, for any t, have the min-drift-minus-penalty equation:

$$L(t) - V\mathrm{E}\left\{\sum_{i\in £} U_i\left(\left|b_i(t)\right|\right) \mid L(t)\right\} \quad (9)$$

where $\mathrm{E}\{x \mid y\}$ denotes the conditional expectation of x at a given y and V is the penalty factor.

Based on the above reasoning, the following inequality can be proved:

$$\begin{aligned}&\Delta L(t) - V\mathrm{E}\left\{\sum_{i\in £} U_i\left(\left|b_i(t)\right|\right) \mid L(t)\right\}\\ &\le B' - V\mathrm{E}\left\{\sum_{i\in £} U_i\left(\left|b_i(t)\right|\right) \mid L(t)\right\} + \sum_{l\in L} H_l(t)\mathrm{E}\left\{g_l(t) \mid L(t)\right\}\\ &+\sum_{i\in £}\sum_{j\in P_i(t)} Q_{ij}(t)\mathrm{E}\left\{\lambda_{ij}(t)\alpha_i(t) - b_{ij}(t) \mid L(t)\right\}\end{aligned} \quad (10)$$

where B' is a constant and satisfies:

$$B' \ge \frac{1}{2}\mathrm{E}\left\{\sum_{i\in L} g_i(t)^2 + \sum_{i\in £}\sum_{j\in P_i(t)}\left(\lambda_{ij}(t)\alpha_i(t) - b_{ij}(t)\right)^2 \mid L(t)\right\} \quad (11)$$

Inequality (10) gives an upper bound on the drift-minus-penalty, so the original problem (2)-(6) can be decomposed into the following independent optimization problems on each time slot:

$$\begin{aligned}\text{Minimize} &- V\sum_{i\in £} U_i\left(\mathbf{b}_i(t)\right) + \sum_{l\in L} H_l(t) g_l(t)\\ &+\sum_{i\in £}\sum_{j\in P_i(t)} Q_{ij}(t)\left(\lambda_{ij}(t)\alpha_t(t) - b_{ij}(t)\right)\end{aligned} \quad (12)$$

$$\text{Subject to } b_{ij}(t) \in \left[0, \lambda_{ij}(t)\alpha_i(t) + Q_{ij}(t)\right],\ \sum_{j\in R_i(t)} \lambda_{ij}(t) = 1, \forall t, i, j \quad (13)$$

Furthermore, by observing the equations of (12)(13), it is found that the control parameters $b_i(t)$ and $\lambda_{ij}(t)$ are linearly decoupled; therefore, (12)(13) can be further decomposed into two subproblems of request scheduling and rate control.

Request scheduling subproblem: Considering the term (11) containing the input request rate scheduling parameter $\lambda_{ij}(t)$, the following request scheduling subproblem can be obtained:

$$\text{Minimize} \sum_{i \in £} Q_i^T(t)\alpha_i(t) \qquad (14)$$

$$\text{Subject to } \lambda_{ij}(t)\alpha_i(t) \geq b_{ij}(t) - Q_{ij}(t) \qquad (15)$$

$$\sum_{j \in P_i(t)} \lambda_{ij}(t) = 1, \forall i \in £, j \in P_i(t) \qquad (16)$$

where $Q_i(t) = \left[Q_{ij}(t), j \in P_i(t)\right], \lambda_i(t) = \left[\lambda_{ij}(t), j \in P_i(t)\right]$ is the vector of queue lengths and scheduling parameters corresponding to i, respectively. Since for $i \neq k$, $\lambda_i(t)$ and $\lambda_k(t)$ are divisible, each user i can independently decide its request scheduling policy by solving the following problem.

$$\text{Minimize } \alpha_i(t) \sum_{j \in P_i(t)} Q_{ij}(t)\lambda_{ij}(t) \qquad (17)$$

$$\text{Subject to } \lambda_{ij}(t)\alpha_i(t) \geq b_{ij}(t) - Q_{ij}(t) \qquad (18)$$

$$\sum_{j \in P_i(t)} \lambda_{ij}(t) = 1, j \in P_i(t) \qquad (19)$$

The solution of (16)-(18) depends on the feasible domain of $\lambda_{ij}(t)$. If $\lambda_{ij}(t)$ is in the interval $[0,1]$, i.e., $\lambda_{ij}(t) \in [0,1]$, (16)-(18) is a linear programming problem whose analytic solution can be given by the simplex method. In some ICN designs, such as NDN, each request (packet of interest) corresponds to a given packet with a maximum payload of 1500B. Thus, at each time slot t, the number of interest packets generated by user i is equal to $\lceil \alpha_i(t)/0.012 \rceil$ (when $\alpha_i(t)$ in units of Mbps), where $\lceil x \rceil$ denotes the upper limit of x.

Since the interest packets allocated for each path must be integers, then the feasible set of $\lambda_{ij}(t)$ is discrete and equal to $\left[0,1,\ldots,\left[\alpha_i(t)/0.012\right]\right]/\left[\alpha_i(t)/0.012\right]$. In this case, $Q_{ij}(t)$ can be interpreted as the unit return of $\lambda_{ij}(t)$ and the constraints (17)(18) as the capacity of the backpack, thus making the above problem a bounded backpack problem whose optimal solution can be given by methods such as those in

Let $\lambda_{ij}^*(t)$ denote the optimal solution of $\lambda_{ij}(t)$ in (18)-(19),

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$$\lambda_{ij}^{*}(t) = \arg\min_{\lambda_{ij}\in(5-17)(5-18)} \alpha_i(t) \sum_{j\in P_i(t)} Q_{ij}(t)\lambda_{ij} \qquad (20)$$

Rate control subproblem: By eliminating $\lambda_{ij}(t)$ term in problem (5-11)(5-12), the following rate control problem can be obtained:

$$\text{Minimize} -V\sum_{i\in c} U_i\left(\left|b_i(t)\right|\right) + \sum_{i\in L} H_l(t) g_l(t) - \sum_{i\in C} Q_i^T(t) b_i(t) \qquad (21)$$

$$\text{Subject to } b_{ij}(t) \in \left[0, \lambda_{ij}(t)\alpha_i(t) + Q_{ij}(t)\right] \qquad (22)$$

Notice that the $b_i(t)$'s in the first and third terms in (20) are linearly separable, while the $b_{ij}(t)$'s corresponding to the different i's in the second term are coupled.

Thus, the objective function (20) can be rewritten as:

$$-V\sum_{i\in £} U_i\left(\left|b_i(t)\right|\right) + \sum_{l\in L} H_l(t)\left(\sum_{i\in s_l(t)} \sum_{j\in R_{i,l}(t)} b_{ij}(t) - c_l(t)\right) - \sum_{i\in £} Q_i^T(t) b_i(t)$$
$$\overset{a}{=} \sum_{i\in £} \underbrace{\left(\left(H_i(t) - Q_i(t)\right)^T b_i(t)\right) - VU_i\left(\left|b_i(t)\right|\right)}_{A(b_i(t))} - \sum_{l\in L} H_l(t) c_l(t) \qquad (23)$$

where Equation a holds and can be obtained by rearranging $\sum_{l\in¡} H_l(t) \sum_{i\in s_l(t)} \sum_{j\in P_{i,j}(t)} b_{ij}(t)$ and $H_i(t) @ \sum_{l\in E_{ij}(t)} H_l(t), j \in P_i(t), E_{ij}(t)$ denotes the set of links used by the request flow between (i, j).

Since the condition for (20) to reach the optimal solution is $\nabla A(b_i(t)) = 0$ and $A(b_i(t))$ is a convex function, the optimal solution $b_{ij}^{*}(t)$ of (20)(21) can be given by the following equation:

$$b_{ij}^{*}(t) = \left[U_{ij}'^{-1}\left(\frac{\sum_{l\in E_{ij}(t)} H_l(t) - Q_{ij}(t)}{V}\right)\right]_0^{Q_{ij}(t)+\lambda_{ij}(t)\alpha_i(t)} \qquad (24)$$

Multimedia teaching system compatibility test

Multimedia teaching is mainly in the form of networking, using the vast amount of high-quality teaching resources on the network to expand students' knowledge, so the stability of its system functions is particularly important.

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In the process of functional testing, Microsoft IE8, IE9, IE10 browser, Chrome and 360 browser were used to test the system functions.

The results show that the browser functions intercepted under the verification of the algorithm in this paper are displayed normally, all users passed the test, the network signal is stable during the teaching process, and the algorithm proposed in this paper has credibility for the communication network in multimedia teaching.

Table 1: Browser Compatibility Performance Test

Serial No	Browser	Test scope	Expected objectives	Test result
1	Chrome	All users of system functions	Adopt	Normal
2	360	All users of system functions	Adopt	Normal
3	IE10	All users of system functions	Adopt	Normal
4	IE9	All users of system functions	Adopt	Normal
5	IE8	All users of system functions	Adopt	Normal

Application of Modern Information Technology in Teaching

Study on the current status of modern information technology teaching

As one of the system elements of information-based teaching, the effective application of teaching information resources is inevitably inseparable from the comprehensive consideration of other related teaching elements.

Which factors have the most direct and intuitive impact on the effective application of teaching information resources will be the focus of this study.

In order to clarify the popularity of modern information technology teaching methods, this paper uses a questionnaire to investigate the multimedia information technology teaching methods of college teachers. The survey of the current situation of teachers in colleges and universities is shown in Table 2.

The statistics show that 53% of teachers have a clear understanding of the importance of modern educational technology in teaching and 43% are teachers who belong to experienced teaching staff, and the popularity of modern information and education technology in colleges and universities is high.

However, older teachers are not very proficient in the use of modern new teaching modes 15% and teaching media 17%, and appropriate and easy-to-use training on teaching information technology is needed for older teachers.

Table 2: Survey on the Current Situation of College Teachers

Problem	Project	A	B	C

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Age	Option	26-35 years old	40~55 years old	55~60 years old
	Proportion	25%	43%	32%
Highest education	Option	Undergraduate	Master	Doctor
	Proportion	70%	20%	10%
Teaching age	Option	1-5 years	15~20 years	More than 20 years
	Proportion	37%	43%	20%
Computer operation degree	Option	Very skilled	More skilled	Unskilled
	Proportion	37%	48%	15%
Whether modern information education technology is clear	Option	Very clear	Clear	Unclear
	Proportion	30%	53%	17%

Multimedia technology teaching course content setting

Instructional design principles

The multimedia teaching design based on modern information technology tools has to address three issues: (1) accessibility: lack of or no access to distance learning systems cannot receive media-based content and activities: (2) attrition: lack of motivation, interaction, support or peer collaboration due to foxing among students; (3) quality: lack of quality standards, lack of feedback to students and m from them, lack of inheritance and modernity, and no consideration of quality in the supporting system. The principles of multimedia instructional design are shown in Table 3.

Table 3: Multimedia Teaching Design Principles

Learning problems	Solutions in teaching design	Principles of instructional design
T1: Accessibility	Media selection	Select media based on students' acceptability
T2: Teaching	Comprehensiveness and readability	Fully develop effective materials and guidance that are easy to understand and understand, and provide clear and detailed guidance.
T3:Content	Clarity and feasibility	Test the feasibility for students: difficulty, quantity and acceptance
T4:Teaching quality	Student feedback	Setting up teaching achievement difficulty zoning adjustment
	Error prediction	Do a good job of wrong prediction plan when preparing lessons
	Effect evaluation	Setting up evaluation criteria for teaching and learning achievements
	Teaching plan evaluation	Evaluation, Reform and Inheritance of Conventional Textbooks and Student Aid

		Systems
T5:Motivational Inspiration	Peer cooperation	Arrange peer and peer cooperation opportunities
	Student assistance	System optimized and interactive student assistance system
	learning activities	A certain amount and form of learning activities
	Two-way communication	Synchronous and asynchronous communication

Teaching Content Arrangement

According to the algorithmic principles of multimedia teaching form modeling, the seven aspects of the curriculum design, teaching content, teaching objectives, teaching priorities, teaching preparation, teaching process, board design and post-lesson reflection were analyzed at the student level with codes numbered 1-7, in order to find out the focus of teaching content priorities and enhance the control of teachers' lesson preparation.Students' perceptions of the multimedia teaching arrangement are shown in Figure 3. Students' overall evaluation of the application of modern information and education technology in the classroom is high, with 20.86% and 21.60% of students having a clear understanding of the teaching content and teaching objectives, and with the continuous improvement of multimedia teaching technology, students' perception of the curriculum arrangement is becoming clearer, with a maximum of 35.6% believing that the classroom setting is clear. In the two aspects of board design and post-class reflection, students generally think they can grasp what they have learned in class more clearly and can be inspired after class, which shows that multimedia teaching class can help students quickly understand the important and difficult points set in class and help them clarify their learning ideas. However, the feedback of students' perception level in teaching preparation and teaching process is not strong, mainly because teachers rely too much on multimedia courseware in the process of using multimedia teaching, and some teachers even input their own ideas directly into the courseware for students to see by themselves, ignoring the classroom interaction with students.

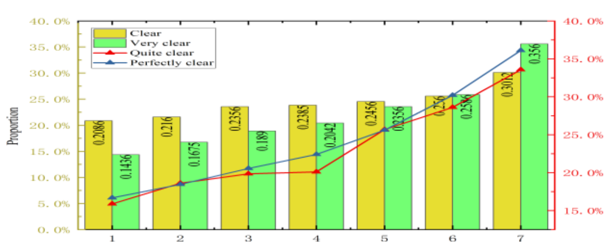

Figure 3: Students' perception of multimedia teaching arrangement

Effective combination of modern information technology and traditional teaching

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methods

According to the content and indexes determined by the principles of multimedia teaching design, the data analysis of teaching assessment results in School A was conducted using the random question decomposition method in multimedia teaching in order to explore the results of the practical application of modern information and education technology in teachers' teaching classrooms.

The assessment of multimedia teaching outcomes is shown in Figure 4. For the five aspects of accessibility, teaching aspect, content aspect, teaching quality, and motivation inspiration teachers and students are generally satisfied that the application of modern information technology in the teaching classroom can improve the richness of classroom teaching mode. In T3 and T4, the number of unsatisfied students accounted for at least 10%, and the percentage of very satisfied students reached 44% and 50%, indicating that the teaching content aspect and teaching quality have been improved. Motivation inspiration is very satisfactory with 56% and very satisfactory with 55%, indicating that modern information and education technology gives students more classroom thinking and can help students to think differently.

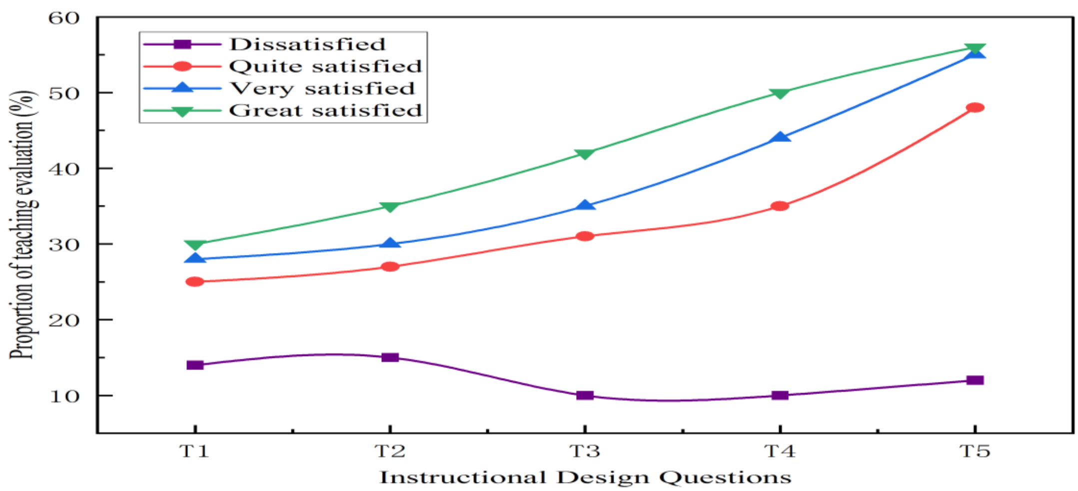

Figure 4: Evaluation of Multimedia Teaching Results

Outlook

Multimedia teaching breaks the rational supremacy knowledge-based of traditional education, emphasizing modern education tools as the unifying factor in the whole education and teaching process, helping teachers to concretize abstract knowledge, giving students a more intuitive feeling of abstract knowledge, and thus mobilizing students to learn actively. As China's modern information education technology continues to mature, the future of China's education field will usher in new changes, with modern information technology talents as the main new generation of teachers will accelerate the improvement of China's overall education level. The future development of education informatization will certainly realize the simultaneous increase of information resources development and security level improvement. The phenomenon of focusing only on the development and construction of resources while ignoring security issues is not adapted to the long-term development trend of education informatization, the lack of security assurance of information resources will certainly be eliminated in the future development, which is also a necessary way to achieve sustainable development of education informatization.

Conclusion

This paper studies the results of the application of modern information education technology in classroom teaching, clarifies the main methods in information education technology teaching at this stage by constructing a multimedia teaching model, and uses multimedia teaching form modeling algorithms and random problem decomposition algorithms in multimedia teaching to obtain research data, and the main conclusions are as follows:

(1) By analyzing the current situation of multimedia teaching application of college teachers, it is found that older teachers are not very skilled in the use of modern new teaching modes and teaching media, and these groups of teachers happen to be older teachers with up to about 15-20 years of teaching experience, and it is recommended that they be given appropriate shallow teaching information technology training to bring the quality of college teaching to a higher level. In terms of teaching content design, students rated the overall application of modern information and education technology in the classroom highly, with a maximum of 35.6% saying that the classroom setting was clear and helped to arrange the learning schedule.

(2) In the assessment of teaching quality, 55% of the students are very satisfied with the aspect of motivation inspiration, and 56% are very satisfied, which indicates that modern information education technology can help students to disperse their thinking and achieve the purpose of maximizing teaching outcomes. Thus, modern information education technology provides strong teaching support and assistance, and teachers can make reasonable use of information resources and modern teaching methods to improve teaching efficiency and enhance students' creative thinking and modern information literacy and knowledge reserves.

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