Design of Online Management System for Painting Teaching Based on Artificial Intelligence Technology

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Abstract. In order to better improve the quality of teaching, the design of an online management system for painting teaching based on artificial intelligence technology is proposed. The hardware structure configuration of the teaching management system is optimized and perfected, and the system software operation process is optimized to improve the system management function. Ensure the effect of system operation and improve the quality of painting teaching. Finally, it is confirmed by experiments that the online management system of painting teaching based on artificial intelligence technology has high operational safety and reliability in the actual application process, and fully meets the research requirements.

Keywords: Artificial intelligence technology · Drawing teaching · Online management

1 Introduction

With the teaching reform as the research background, combined with the preliminary exploration of drawing teaching management of drawing courses in various schools in ur country. After investigating and analyzing the operating status of the painting teaching management system in various schools, it is found that most schools have not perfected the teaching management mechanism of painting courses. The traditional painting teaching online management system based on Web technology is used for painting courses teaching. In the system structure, add an automatic reset circuit; avoid the outflow of drawing resource information, reduce the interdependence between modules, use Web technology, improve the system management function structure, use the fitness function, refine the curriculum management plan, and complete the drawing teaching management system design. However, the management scope of this method has certain limitations, which to a large extent limits the development of painting courses [1].

Based on this, through analysis and research combined with artificial intelligence technology, the painting teaching management system is optimized to reduce the learning pressure of teachers and students, encourage students to study enthusiasm in the learning process, cultivate students' active participation and initiative, and let students We actively understand and explore, increase the emotional communication between teachers and students, so as to promote the coordinated progress of the entire teaching process.

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2 Online Management System for Painting Teaching

2.1 System Hardware Configuration

In the design process of the drawing course teaching management system, we should first analyze the current drawing teaching management system requirements and the business process of the system, so as to summarize the functional requirements and non-functional requirements of the drawing course teaching management system. The following aspects should be paid attention to in the design process of artificial intelligence drawing teaching resource management system: The system provides remote access to the network function, which is convenient for users to access all the material resources of the system anytime and anywhere, and provides a standardized and safe interface for applications [2]. Based on this, data processors and interface configurations need to be added to the hardware configuration. Considering the growth of system resources and storage of large amounts of data, the system must support decentralized data management. Based on this, the system hardware structure needs to be optimized first. The specific structure is shown in Fig. 1:

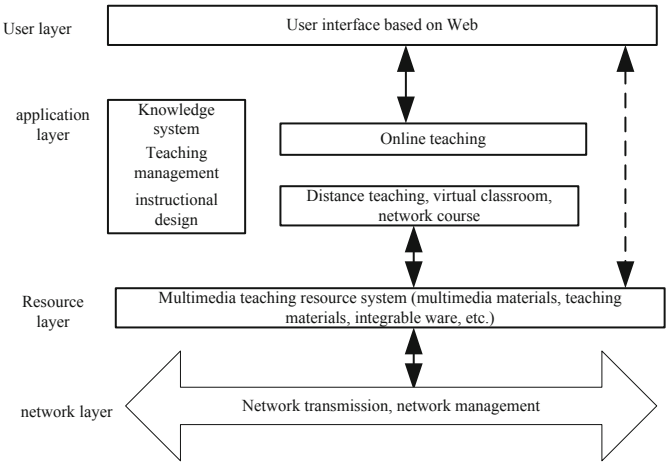

Fig. 1. Overall system architecture

As shown in Fig. 1, the artificial intelligence drawing teaching resource management system consists of a database server, a web server, and an on-demand server. The subsystem can be established on the same server according to the actual situation of other services to reduce hardware consumption. The painting teaching system is designed with B/S and browser/server architecture [3]. Combined with the current tensorflow js launched by goggle, the use of B/S mode can solve the problem of applying deep neural network models to mobile terminals, and can also improve the compatibility and portability of the online management system for painting teaching [4]. The overall architecture adopted by the interactive stick drawing teaching system is shown in Fig. 2.

Among them, the Nginx and Gunicorn modules are non-functionally added according to the final deployment of the painting teaching online management system [5].

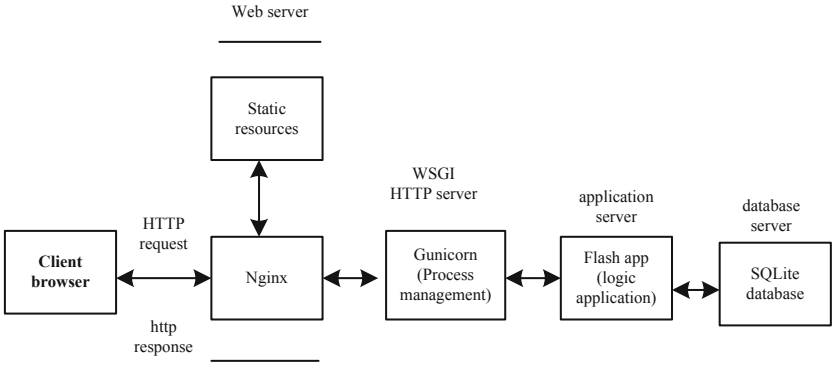

Fig. 2. System overall B/S architecture diagram

According to the B/S architecture of the system, users use the teaching function through the browser web page, the server will process the corresponding http request and return the corresponding response, and the Nginx and Gunicorn modules are responsible for load balancing, asynchronous processing and other operations [6]. System management teaching materials can be divided into online running teaching materials and local running teaching materials according to the daily classification management method.

The teaching material information in the artificial intelligence database needs to collect and manage the specific address and file name of the teaching material, and save the teaching files in the hard disk to sort out and record the information. Determine the use of authorized artificial intelligence teaching materials according to the user group name and different permissions [7]. In order to ensure the effect of system operation, the data processor structure is optimized. The specific system database management architecture is shown in Fig. 3:

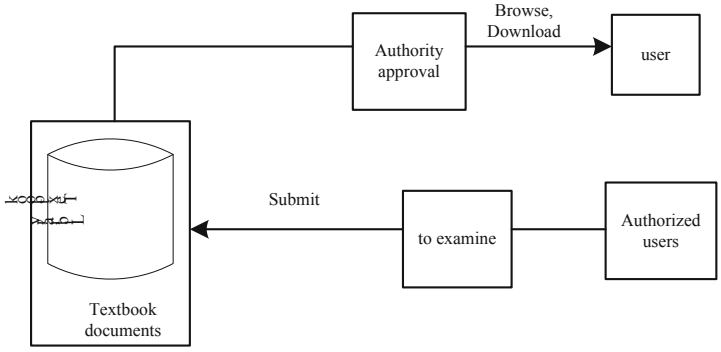

Fig. 3. Data processor structure

In the structured system design method, the method used is the description table of the IPO diagram and the system flow chart to design the overall function and detailed function of the system [8]. The system hardware configuration structure is relatively

simple, the maintenance is simple, and the work efficiency is high. After the information is submitted, the web page can be opened immediately. The authorized user can be the creator of the teaching material or the teacher. Based on this, the system hardware structure is optimized to ensure the system operation effect.

2.2 System Software Function Optimization

The drawing course teaching management system is mainly to assist teachers in teaching. The drawing course teaching of the teacher and the course learning of the students are connected through the system. By analyzing the needs of the drawing course teaching management and the function of the design, the drawing course teaching management system is determined The most important thing about the top-level data stream of the painting course teaching management system is that it can collect and classify relevant information such as course resources for teachers and students, so that teachers and students can learn the latest art information, participate in online learning and testing, and let teachers and students Carry out the needs and characteristics of interactive communication to design the overall structure of the system [9]. In order to realize the basic functions of the painting course teaching management system, and to be able to carry out and manage in an orderly manner, standardize and unify, divide the labour management of different modules, and finally implement it by the system. The overall functional structure of the drawing course teaching management system is shown in Fig. 4.

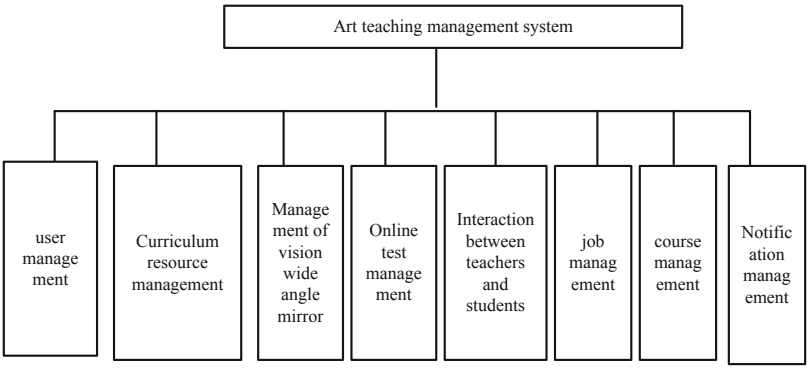

Fig. 4. The overall functional structure of the drawing course teaching management system

As shown in Fig. 4, the system is divided into 8 modules: user management, course resource management, wide-angle lens management, online test management, teacher-student interaction, homework management, course management, and notification management. Among them, user management is mainly to realize the functional requirements of corresponding operations for all users of the drawing course teaching management system.

Curriculum resource management is mainly to realize the functional requirements of uploading relevant materials and information of the course to the Internet, and to provide students with the functional requirements for downloading and viewing. The visual

wide-angle lens management is mainly to realize the functional requirements that can be presented in the course results of the painting course teaching management system. Online test management is mainly to realize that teachers can accurately master [10], the functional requirements of students on the learning status of painting courses, and the interaction between teachers and students is a very important functional requirement in this system. This function can not only enhance students' understanding of painting courses. The interest can also enable students to cultivate their sentiment, increase their knowledge, and broaden their horizons; homework management is mainly to realize the functional requirements of the release and submission of homework. Teachers can release homework according to the class situation and urge students to complete homework in time. Students can directly view the results of homework corrections in this module, and the results will be saved in the student account information [11]. Curriculum management is mainly to realize the functional requirements for recording the progress of students' learning courses. Students can download courseware, and teachers can monitor the progress of students' learning and remind students of their progress; notification management is mainly to implement the functional requirements for issuing notifications during the teaching process and record The process of the next operation, standardize the process of notification issuance. Based on this, the functional structure of the job management module is optimized as shown in Fig. 5:

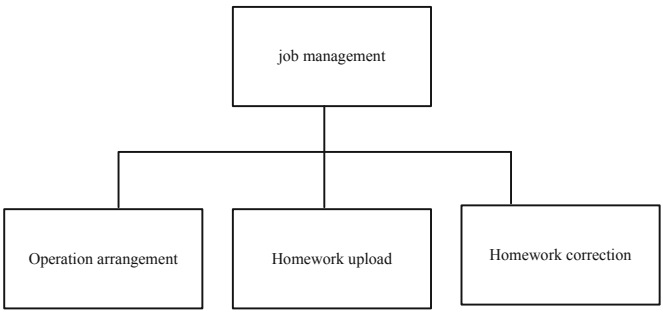

Fig. 5. Functional structure diagram of job management module

As shown in Fig. 5, the functional structure diagram of the course management module. This part of the module includes course subject management and learning progress management. In order to be able to improve and pay attention to the curriculum concept of teachers in curriculum management, and to promote the growth of a professional teacher, it is necessary to strengthen the implementation of curriculum management in a school [12]. Mainly to expand the enthusiasm of students. The prerequisite for constructing curriculum management well is student-oriented. In addition, the implementation of curriculum management requires training for some teachers, so that a complete management plan can be developed, allowing teachers and students to rationally use the resources on the Internet to create better and favorable conditions for painting teaching.

2.3 Realization of Online Management of Painting Teaching

Software information resource management plays an important role in the teaching system. In the process of optimizing the software function of the drawing teaching management system, the theory, concept, content, etc. must be combined with the traditional teaching mode, but the main teaching is based on the campus network. Mainly, the traditional teaching mode is supplemented, the courses are arranged reasonably, and the new software engineering technology is arranged in the new software engineering technology to transfer the knowledge to the students perfectly. The establishment of courses is very necessary. Including specific software management subjects and software configuration subjects, focusing on making software engineering, teaching software quality knowledge through network teaching [13]. The establishment of systematic practice courses is also very necessary. Through the campus network, students can independently understand the content of software engineering courses, innovate and develop corresponding software engineering designs, and actually participate in software development projects. Simulations are conducted in the form of groups, with the theme of improving software functions, through the campus The real-time live broadcast of the Internet enables more students to participate in it, so as to improve the students' interest in drawing learning and the quality of teaching management.

In the online management system of drawing teaching, both teachers and students must pass the design of teaching curriculum resource management module to be able to implement it. This module can be divided into course resource upload, course resource release, course resource cataloging, course resource research, course resource query statistics, course resource download. The upload of data, the download of related files, and the notification of announcements must all be included in the course resource management module. In addition, it is about how to select and set up the relevant information of the course materials and how to delete, modify and reduce the relevant information content., There should be a relevant teacher in charge to write. Based on this, the functional structure of curriculum resource management is further optimized, as shown in Fig. 6:

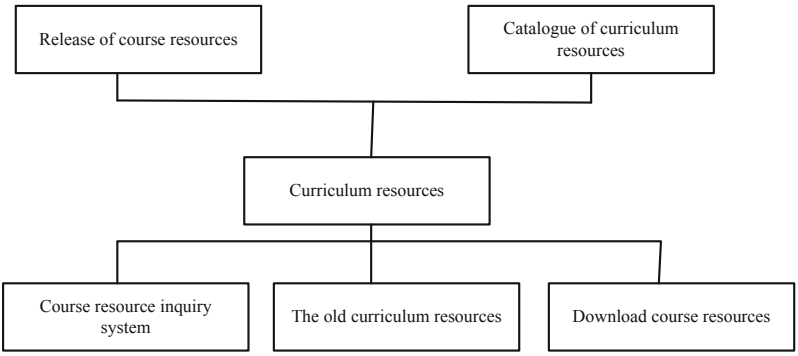

Fig. 6. Course resource management module

Online test management includes exam content management, exam management, scoring management, and score management. This part of the module can add, modify and delete the existing test questions in the question bank. Students can choose the type of questions related to them to conduct a comprehensive and complete online test according to their actual ability and the type of questions the teacher is giving. Course planning in the course of teaching content can be set up by the teacher to set the parameters of the test questions (test scores, overall level of difficulty, test time, etc.). Teachers can also manage the entire test process and specific time. If you want to manipulate the student' s learning activity status in a timely manner and grasp the students' understanding of the teaching content, they must grasp the student's dynamics through online testing. If you want students to view their own academic performance and evaluation of teachers, and clearly recognize the problems in their work, students can also practice their own exam content through online tests, which can also be better Clearly clarify the level of learning the students have mastered for the course. Modules such as selecting test questions, answering questions, teacher's evaluation of students, and comprehensive test results are all included in the online test. Based on this, the online test information management function structure is further divided, as shown in Fig. 7:

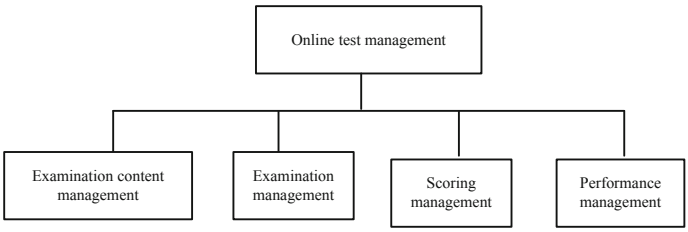

Fig. 7. Online test management module

The online test management module includes course subject management and learning progress management. In order to improve and pay attention to the curriculum concept of teachers in curriculum management, and to promote the growth of a professional teacher, it is necessary to strengthen the implementation of curriculum management in a school. The main thing is to mobilize the enthusiasm of the students. I personally think that the curriculum management must be built well, and the premise is to be student-oriented. The implementation of curriculum management also requires training for some teachers, so that a complete management plan can be formulated so that teachers and students can use more resources on the Internet to create better and favorable conditions. Further plan the main categories of course management, as shown in Fig. 8:

Further design the system notification management module, which includes the planning of four sub-modules. Notice management, notice withdrawal management, notice reading management, notice withdrawal management. The scope of the notice is very common, whether it is in public places, units or campuses, it can be seen everywhere. It shows that the notice can play a very important role. Most of it is used for the arrangement of course announcements. Students' affairs, in addition, they will also make requirements and affirmations for some related information, especially the required procedures for the

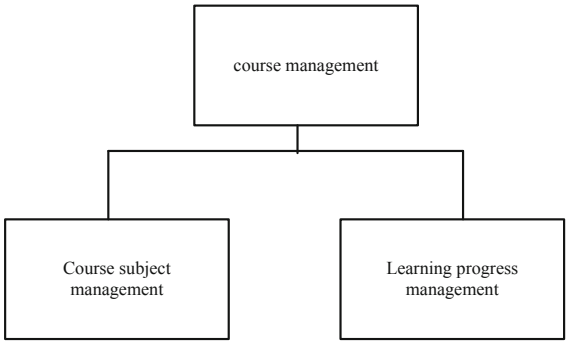

Fig. 8. Course management module

transfer of certain requirements, so that students can be more clear about the tasks they want to perform. The key is that the things to be described must be Brief description. The notification management module is shown in Fig. 9:

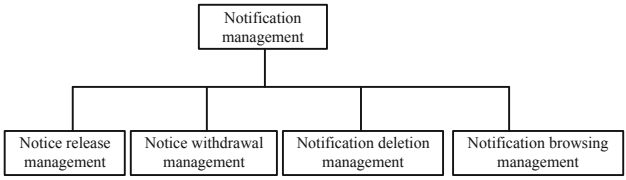

Fig. 9. Notification management module

From the perspective of the business process and the corresponding data flow diagram, if you analyze from the demand analysis, you can obtain user registration diary, user login diary, student information, user privileges, teacher information, published resources, and course resource catalog table., Courseware materials, homework, delete resource records, download records, art policy trends, latest art exhibition information, master catalog tables, well-known works catalog tables, test questions, completed test questions, corrected test questions, transcripts, query records, teachers Messages, student messages, questions, answers, homework content, completed homework, list of student grades, homework results, course resources, course list, student learning progress, announcement notice, withdrawn announcement, deleted announcement, announcement browsing history etc. According to the relationship of each entity obtained between business processes, it can be seen and determined that the entities can obtain their respective attributes. Based on this, the system operation process is further optimized to ensure the accuracy of evaluating students' drawing ability. In real painting teaching, professional teachers generally check the students' current completion progress and accuracy in real time, and give certain guidance. The purpose of this system to realize the function of evaluating painting is to evaluate the current painting works of students, and then give

feedback to the students. Based on this, the system operation fluency is further optimized, and the specific steps are shown in Fig. 10:

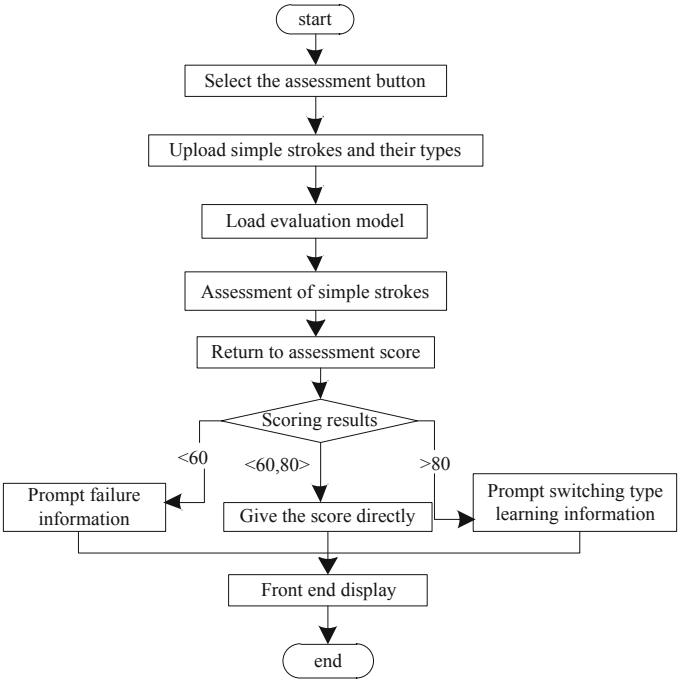

Fig. 10. Flow chart of teaching management

The analysis and design of the drawing course teaching management system is open and shared. By applying some of the above-mentioned comprehensive related technologies, they form a joint system development and design. The completed work generally summarizes the following aspects. According to the teaching management system of the painting course according to the work needs, the research background of this course system and the research status and future prospects of the course system at home and abroad are differentiated. In addition, the necessary prerequisites for building a curriculum system should be discussed based on the characteristics of drawing teaching in primary and secondary schools and the current management situation. The overall structure design idea of the drawing course teaching management system is to use the principles and methods of software engineering to conduct a systematic demand analysis and design. Through the analysis of business requirements, functional requirements, data requirements and non-functional requirements, business flowcharts, data flow diagrams and data dictionaries are used to model teaching management requirements. The drawing teaching management has carried out detailed analysis in various business processes, distinguished the use of drawing teaching course management system in the process of performance demand analysis, and gave a model for each data flow diagram. Finally, it mainly focuses on the research of some related design systems of this subject and the

shortcomings in the system design. It also looks forward to the next step of planning and development to ensure the operation effect of the system.

3 Analysis of Experimental Results

In order to comprehensively test the functions, performance, safety, and reliability of the drawing teaching management system, according to the use of this system, the school and the technical developers of this project will jointly test the network environment: local area network, virtual private network, the client uses P3 Above host computer, memory 128M or above, hard disk above 10G, server end adopts HP30001 software environment: client operating system Windows 2000 Windows XP, server end installs software according to the design plan. Further standardize the system operating environment, as shown in Table 1:

Table. 1 Test environment description table

Configuration name	Test environment 1	Test environment 2	Test environment 3
OS	Ubuntu18.04	masOS10.13	Windows 10 × 64
CPU	Intel(R) Xeon(R)	Intel core i5	Intel Core i5
GPU	1080Ti	Nothing	Nothing
Memory	32G	8G	8G
Flag version	1.0.2	1.0.2	1.0.2
Tensorflow version	1.2.0	1.2.0	1.2.0
CUDA version	9.0	/	/
Browser	Chrome	Chrome	IE

The system research and development adopts java language, the operating system is Windows 10, according to the actual application situation, carries on the local area network test, selects the operation parameter corresponding to 4 hosts to set up, as shown in Table 2.

Table. 2 Experimental parameter settings

Test tools	Memory size/G	Hard disk size/G	Control system	Set quantity
The server	4	500	Linux	1
Host A	2	250	Win10	1
Host B	4	300	Win8	1
Host C	4	300	Win6	1

The traditional online management system for drawing teaching based on Web technology is compared with the time spent in the running process of this system to verify the efficiency of this design system. The result is shown in the figure (Fig. 11).

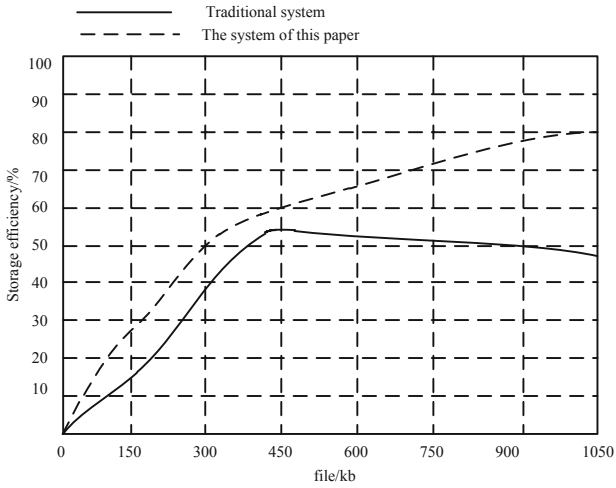

Fig. 11. Comparison of data management performance between the two systems

The traditional system and the time spent in the operation of the system in this paper are compared to verify the efficiency of the system designed in this paper. The result is shown in Fig. 12.

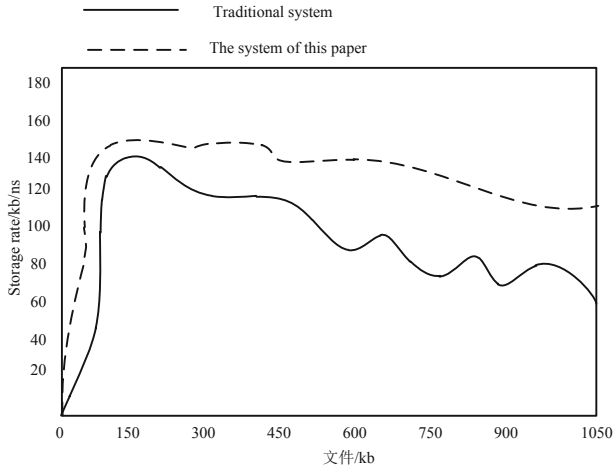

Fig. 12. Comparison of storage rates between the two systems

Based on the above detection results, it can be seen that in the actual operation process of the online management system for drawing teaching based on artificial intelligence proposed in this paper, it has better management efficiency and faster running speed, which can just achieve effective management of massive drawing teaching data. Improve teaching quality and guarantee teaching effect. After the above-mentioned series of experimental tests, it can be concluded that the system design is reasonable.

4 Concluding Remarks

On the basis of in-depth analysis of the current status of the teaching management system of painting courses, through scientific and reasonable exploration, practice and planning of the system hardware structure and software operating functions, the system operation performance is effectively improved, and the management layout and planning of the system system are carried out. And the system optimizes the management information and functions of different modules, and establishes the database table structure for the planning of the overall framework of the system. Finally, the analysis and design work done is summarized, and the future direction of the system is expected to be improved, To better improve the management effect of drawing teaching information and guarantee the quality of drawing teaching.

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