

Design and Development of High School Curriculum Learning System Based on the Core Quality of Mathematics

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Abstract: Mathematics plays a unique and irreplaceable role in forming human rational thinking, scientific spirit and promoting human intellectual development. It is worth studying how to cultivate the core quality of high school students. Under the background of Internet +, many Internet education service industries have further developed, and efforts have been made to study the effective integration of subject knowledge and information technology to improve students' learning effectiveness. Mathematics, as one of the core courses of high school education, highlights its importance. Based on the core quality of mathematics, this paper constructs a new model of high school mathematics knowledge, and designs and implements the framework of high school curriculum learning system. Teachers adjust teaching content and strategies according to the actual situation of students, improve classroom efficiency, gradually achieve high-level teaching goals, and train new talents who can adapt to the needs of the new era in modern teaching.

1. Introduction

In the past few years, the rapid development of artificial intelligence has led to several notable events: Alpha Go swept the top Chinese, Japanese and Korean Go masters and won the human championship. It was called "Ah teacher." The first book of poetry written by robots in human history, "Sunshine Lost Glass Window," was written by the young poet Xiao Bing, who inherited 519 modern Chinese poets since the 1920s. In the age of artificial intelligence, computers can do a lot of things. How do people distinguish themselves from computers? How can human skills be distinguished from artificial intelligence? A very important skill is innovation, which creates new values. Simple questions, easy knowledge points, rote memorization is more effective. But as the problem becomes more difficult, rote learning becomes more and more useless, and sometimes it also hinders students from solving the problem. Why? Now that the world is constantly changing, we no longer have many easy problems because easy problems are solved by computers. Complex problems require your skills as a person, and people need to become better and better to perform more complex thinking and reasoning.

2. Background of the system design

Changes in educational patterns in the course of human civilization:

	Primitive society	Agricultural era	Industrial era	Information times	Intelligent age
Power system	Adapting to the environment for survival	Rebuilding the environment for survival	Skills acquisition into occupation	Personal development	Community of Human Interests



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Learning content	Survival skills Tribal customs	Agricultural knowledge Ethics	Manufacturing skills Scientific knowledge Humanities	Information literacy Self-development Social participation	Learning ability Design and Creation social responsibility
Learning style	Imitation Trial and error Experience	Read Chant Understand	Listening Remembering Answering questions Master learning standardization	Mixed learning Cooperative inquiry Connectivity learning Differentiation	Extensive learning Collaborative Construction Real learning Personalization
Learning environment	Field Uncertainty time	College etc. Fixed period	School Public places Definitive time Teaching cycle	School Cyberspace Elastic time	Without borders Arbitrary location Any time

The first GES Future Education Conference was opened in Beijing on November 28, 2017. The conference built a global future education event based on China and affecting the world with the theme of "scientific and technological innovation to promote education progress." On December 3, 2018, the GES 2018 Future Education Conference took the theme of "Integration and Innovation to Light up Everyone", "School and Society", "Education and Technology", and "Regional and Global" as the core issues, and focused on education. The issue of ideological collision, To explore the future of education.

3. Analysis of system design

The most popular online teaching platform today is summarized as follows:



The classification of the curriculum learning methods of high school mathematics in the platform is basically two modes: one is to select the required textbook version, such as the humanist version or the Beijing Normal University version, and to carry out gradual learning according to the order of the

knowledge points in the textbook. mode. The other is a comprehensive learning model for special topics or sprints. The core literacy of mathematics is the popular theme now. "Internet + education" also conforms to the national policy guidelines and the general trend of the development of the times. Therefore, the design and development of the high school curriculum learning system based on the core literacy of mathematics is of great research value and practical significance.

4. Selection of system development tools

The development of the system requires the design of a visual user interface, so choose to operate the Visual Basic language for compilation. The ultimate goal is to use Visual Basic to create applications that require engineering. When you need to create an application, you usually have to create some new forms. ActiveX controls and objects from other applications can also be shared between projects.

5. Design of system function module

5.1 Management of examination papers

This system will define the paper class object for easy management. High school mathematics examination paper design three kinds of questions, namely single choice, fill in blank questions, question and answer questions, meet the requirements of college entrance examination questions. At the same time set up a specific method to create, answer, review the paper.

5.2 to create, browse and revise examination papers

The system can use two different methods of operation to achieve the function of creating a test paper. The first is to use the method of independent proposition to create the test paper. Specifically means that the system grants the user the permission to browse the question library and the function of selecting questions from the question library. The other is to use the automatic proposition method to create the test paper. That is, the learning system randomly selects the questions and automatically generates the papers for use by the user. In this process, the user only needs to determine the total number of questions in the test paper that needs to be tested, the specific type of questions, and the number of specific questions.

5.3 Issue bank management

The main design of the system, according to the core quality of mathematics, will be refined into six corresponding small problem libraries, focusing on different literacy training. Question bank management is to the questions in the question bank often screening, adaptation, deletion, replacement and optimization. It is necessary to follow the college entrance examination, competitions, hot spots and trends, remove outdated Chenti and old topics, improve some of the original topics by replacing or adding conditions and conclusions, and create some advanced and up-to-date new topics in connection with the current current reality issues or major events. The purpose is to allow users to use the experience of the database to multiply each time, subtly fall in love with learning mathematics.

5.4 User management

The specific users of the system are divided into three categories. The first category is a student class user, the second category is a teacher class user, and the third category is an administrator class user, giving them different operating rights.

5.5 Answer module

The specific user of the answer module of the system is a student user. Regardless of the way in which math papers are created in the front, students are required to complete the exam within a time limit. There are two options for the form of the exam. The first is an online exam, which is answered directly within the answer area of the system. After completing the final answer, the test paper can be submitted. The second is to print the paper generated by the system, and then the teacher or student chooses a

scheduled time and place to perform the traditional regular examination.

5.6 Modules for examination papers

The single choice of objective questions in the test papers is the system automatic score. The subjective questions in the test papers include blank questions and questions. For student users, students score independently according to the reference answers and scoring rules. For teacher users, teachers can review the test papers and manually score.

6. System database design

In Access 2000, the first action is to create a database, then name the database Math.mdb, and then place the new database in the application's directory for later use. The details are shown in table 1.

Table 1 The database Math.mdb includes data tables and their functions

Data table name	Functions to be implemented
SingleSel	The system needs a single topic database
Filling	The system needs to fill the blank question library
EssayQuestion	Questions and Answers for the System
Student	The system stores basic information for student users
Teacher	System storage of basic information for teachers
Admin	The system stores basic information for administrator class users
QuestionPaper	The basic information of the paper is stored in the system

7. Implementation of the system development process

Create a project in Visual Basic named "Math. vbp" and copy the previously created Access database Math.mdb to the project directory to facilitate the establishment of data connections.

The design of the system's main form page is given here, as shown in Figure1.

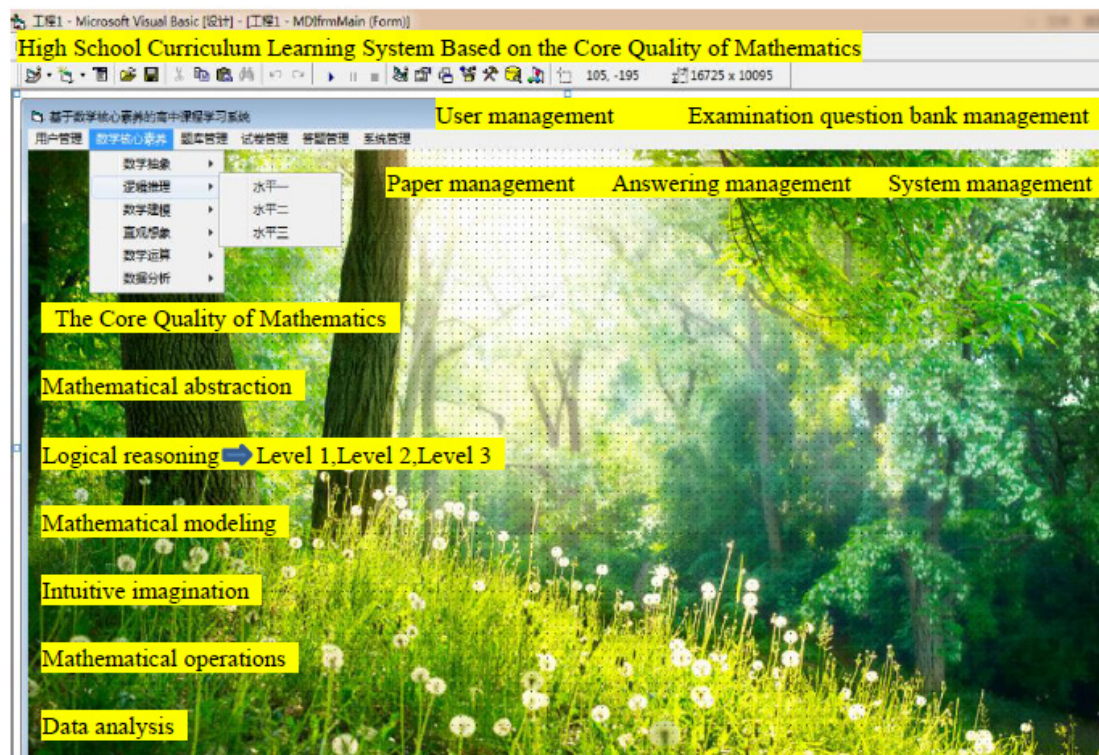


Figure 1 Design view of the main window body page

8. Packaging and publishing of applications

First, click the Project Properties option on the main menu. Then, in the project properties form that pops up, set the option in the Build tab to the Build to P-Code item, followed by the single Click the "File" <UNK> "Generate Math.exe" option on the Visual Basic main menu so that this "High School Curriculum Learning System Based on Mathematical Core Literacy" can be made into an executable file Math.exe, and finally it can be officially packaged and released.

9. Conclusions

"Five years from now, you'll be able to get the best courses in the world for free on the Internet, and they'll be better than any single University," Bill Gates said in 2012. By that time, what was learned at MIT and what was learned in online courses should be recognized. With the support of information technology, education and teaching have undergone earth-shaking changes. The form of education has already broken through the traditional model and has become very diverse. The methods of online and offline mixed teaching and pure online teaching are all applied to the mathematics learning of current students. You can see the APPs for learning junior high school mathematics downloaded from students' mobile phones anytime, such as the more popular ones: homework help, quiz library, onion mathematics, and so on. Therefore, based on the perspective of mathematics core literacy, the design and development of the junior high school mathematics curriculum learning system has its own characteristics, adapt to the current trends and trends of the learning system, there should be a very good prospect.

Fund projects

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References

- [1] Baker, R. S., & Inventado, P. S. (2014). Educational data mining and learning analytics. In *Learning analytics* (pp. 61–75). New York, NY: Springer.
- [2] Chatti, M. A., Dyckhoff, A. L., Schroeder, U., & Thüs, H. (2012). A reference model for learning analytics. *International Journal of Technology Enhanced Learning*, 4(5–6), 318–331.
- [3] Huang, Y.M., Chiu, P.S., Liu, T.C. and Chen, T.S. (2011) 'The design and implementation of a meaningful learning-based evaluation method for ubiquitous learning', *Computers & Education*, Vol.57, No.4, pp.2291–2302.
- [4] Liu, G.Z., Kuo, F.R., Shi, Y.R. and Chen, Y.W. (2015) 'Dedicated design and usability of a context-aware ubiquitous learning environment for developing receptive language skills: a case study', *International Journal of Mobile Learning and Organisation*, Vol. 9, No. 1, pp.49–65.
- [5] Yang, T.-C., Hwang, G.-J., Yang, S. J. H., & Hwang, G.-H. (2015). A two-tier test-based approach to improving students' computer-programming skills in a web-based learning environment. *Educational Technology & Society*, 18(1), 198–210.
- [6] Chen, C. H., Wang, K. C., & Lin, Y. H. (2015). The Comparison of solitary and collaborative modes of game-based learning on students' science learning and motivation. *Educational Technology & Society*, 18(2), 237–248.
- [7] Jou, M., Tennyson, R. D., Wang, J., & Huang, S. Y. (2016). A Study on the usability of E-books and APP in engineering courses: A Case study on mechanical drawing. *Computers & Education*, 92, 181-193.

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