

Research on the Construction Method of Sustainable Resource Database on a Dual Platform Basis

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Abstract: With the popularization of network technology, the construction and application of network resource database has become a hot spot. However, there are common problems in the construction and application of the resource database, such as the slow update and unstable quality of resource database construction, and the low application rate. This article proposes a solution to solve the problem of low application rate by using resource database on a dual platform of mobile phone and webpage “Cloud Classroom”. It also proposes a sustainable resource library construction proposal, which highlights students’ learning in the classroom teaching process and encourages feedback and updates from students to improve the construction of the resource database. Build a sustainable resource database on the basis of emphasizing the importance of students throughout the whole process of learning.

1. Introduction

With the development of information technology and the rise of the concept of building a learning society, educational resources are gradually becoming open and shared. A large number of open courses made by universities and enterprises have made contributions to solving problems such as unbalanced distribution of educational resources, poor systematical structure of majors in universities. These open courses also help to provide comprehensive education to the society. The characteristics of resource database construction therefore are shifting from “quantity” to “quality”. There are still two typical problems in the application and construction of the resource database: a low application rate, and slow update of high quality resource database. This article studies two questions from improving application quality and building a sustainable resource database.

2. History and problems of Network Resources Database

The construction of the curriculum resource database enables the elements of learning from a single “paper textbook” to a multiple choice, for example electronic textbook, PPT, pictures, videos and so on. With a coordinate teaching of multiple elements and the use of network resources by students in the teaching process, students’ participation rate rises and therefore study quality is improved. The design and innovation of teaching resources is actually a series of teaching and research processes. When our country begins to explore the issues related to teaching resources, the construction of teaching resource database is one of the important contents. However, the relevant study pays more attention to the technical problems of building a “resource database”, basic theoretical questions such as the innovative development of resources and how to use them are still to be discussed. Practical requirements are important dynamic source and future direction. From the demand for resources from teaching practice, reviewing the history of resource database development, and predicting its development direction, are effective approaches to explore the development of teaching resources construction.

2.1 Development History

Since the beginning of the 21st century, the rapid development of the Internet has led to a

network resource database construction boom. The construction of resource database has enabled the sharing of high-quality education resources in various universities to promote educational equity and improve the education quality. This has become a hot issue in the field of education research in China [1]. In 2003, China launched a major education and teaching reform project in the process of education informatization—a national excellent course construction project [2]. The construction of resource database has greatly promoted the sharing of high-quality courses and played an obvious role in education for all, but there are still problems like "emphasizing registration while neglecting construction, emphasizing sharing while neglecting application, emphasizing evaluation while neglecting teaching" [3]. In 2011, the Ministry of Education decided to implement the "National Fine Open Course" during the "Twelfth Five-Year Plan" period. In the next five years, it will organize the construction of 5,000 quality resource sharing courses in colleges and universities. Wang Juan and Liu Mingzhuo discussed the problems of single channel acquisition, unsatisfactory application results, and proposed corresponding solutions based on the survey of the application of college quality courses in 2013[4]. In 2015, Sun Tianlinzi & Zhang Shuyu etc. illustrated the innovative path of curriculum resource construction with the example of visual culture course [5]. In 2017, Zhang Fenxiang conducted a research on the construction of professional education teaching resource database and its application of open education under Internet Plus environment [6]. How to learn from the past studies in the construction of teaching resource database has become the focus of the moment.

2.2 Problems

Through many years of efforts in the construction of open course resource database in China, many achievements have been made. However, compared with developed countries, there are still many common problems.

2.2.1 Single Platform

At present, webpage is the major media of current resource database platform, and the carrier for web browsing resources is mostly computers. Because the size of computers is relatively large and they are inconvenient to carry, it results in a small amount of application. Recently, smart machines coverage in student nearly reaches 100%. But resource database platform APP R&D goes on slowly, which is far behind the development of APP R&D in game industry. Therefore, students' spare time is basically occupied by playing games.

2.2.2 Poor Quality

The traditional construction of the database relies only on the one-way development of teachers, compiling teaching materials from the perspective of the educators, and designing the teaching process and content. Learners' perspective is absent and they are only passively accepting the teaching, which could not meet the diverse learning needs of students. One-way development of resources makes it a static resource and lacks self-renewal capabilities. Database updates relying on only a few administrators cannot cope with a dynamic teaching environment [7]. According to a sample survey, 76% of state-level quality courses have not been updated within half a year, and some have not even edited any content since the launch[8]. The cost of building a resource database is high, and it requires a lot of manpower and material resources. Some outdated learning resources are not suitable for real-time teaching, losing their original value and failing to keep up with the times. The teachers cannot fully understand the feelings of learners, so one-way development will lead to more loopholes. A blind piling up of the textbooks brings lots of problems, including inflexible teaching process, unattractive curriculum content and interface design, simple teaching style and resources, low curriculum availability and applicability, etc.

The nature of these common problems that arise in open curriculum construction is that the traditional one-way resource development model can no longer meet the students' growing new demand for learning resources.

3. Service Platform Construction

With the development of the Internet and the increasing coverage of smart phones, in addition to daily work, the tool of Internet surfing is basically mobile phone. The emergence of smart phones also produces a lot of fragmented time, such as waiting for a bus, break time, etc. Traditional database platform pays more attention to web performance, which is not very friendly to mobile phone users as browsing a website on mobile phone is not so convenient. The poor usability seriously slowed down the development of the platform and the use of resources. The construction of a resource database is not once-for-all, but a dynamic process. It requires continuous improvement and updating by following the principle of “excellent, open, and updated” and standards and formation. Obeying basic requirements of network communication of the curriculum, database construction should be optimized and enhanced, establishing a unified operation and management platform with publicity, promotion, evaluation and management systems, thereafter achieves maximized openness, sharing, effectiveness.

“Cloud Classroom” platform is designed based on deep reflections on traditional teaching service platforms and organic integration of scattered teaching application systems in current vocational colleges. It aims to provide vocational colleges with information-based services during the entire teaching process. Resources are developed and managed on a unified sharing platform, and a mobile APP was developed to facilitate mobile fragmentation learning. The platform is centered on student service and application-oriented. It fully considers the characteristics of various users such as schools, teachers, students, enterprises, and provides smarter, more convenient, and more personal services.

“Cloud Classroom” provides a dual-platform application: using both computer and mobile APP to organize and operate teaching. This dual-platform operation is conducive to the efficiency of the web version, at the same time helps learners use the mobile phone to participate in the learning process efficiently, as shown in Figure 1.

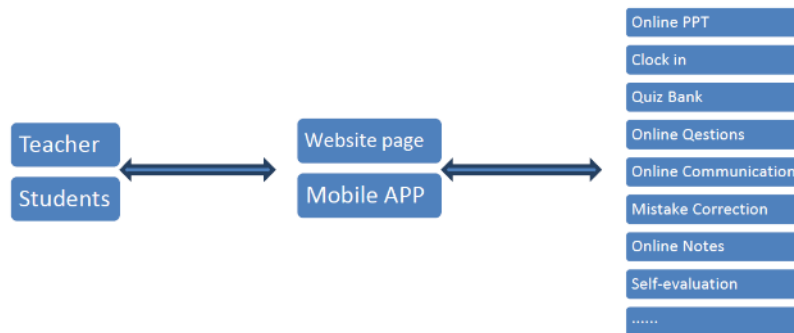


Figure 1. Operation based on a dual-platform application

“Cloud Classroom” provides a variety of learning support, such as learning process tracking and recording, online PPT, online quizzes, question banks, micro lessons, learning feedback, after-class Q&A and discussions, as shown in Figure 2. In addition, the open platform has a navigation design with features of open and diversity. It offers learners synchronous and asynchronous, real-time and non-real-time interactions, promotes the construction of a learning community. Based on different teaching content, it creates a variety of teaching module, design teaching activities, enhance learners’ participation, and improve the efficiency of the curriculum. What’s more, it helps to strengthen curriculum management monitoring to ensure the continuity of resource construction, enrich the forms of expression of resource media, ensure synchronous and asynchronous resources, real-time and non-real-time two-way transmission. It enhances the timeliness of resources, reorganizes, integrates and recreates resources to assure an open, scalable, dynamic structure, instead of a collection of static resources.

4. Sustainability Update Method

Network resource database itself obtains openness as it faces a variety of learning needs from a

wide range of regional differences. When it only can be updated by teachers, it has certain constraints and will lead to a slow resource update and unstable quality. With this decline, the linear learning process cannot fully satisfy the learner's individualized needs, making the learner a passive acceptor rather than an active agent of processing knowledge. Therefore, broadening the resource development path is a prerequisite for ensuring quality resources. However, it is inevitable that teachers will not fully understand the learners' learning experience, and is difficult to perceive omissions in the teaching process. It is also hard to ensure that teaching resources are introduced in a timely manner. Therefore, we should encourage students to be active constructors to develop resources from the perspective of learners, therefore achieving infinite beneficial cycles of resources [9]. The construction of the network resource database should start from the analysis of the learners' needs and be guided by the learners' high-quality learning effects. It should create a learner-centered online learning environment, restore the students' subject status, and enable learners to actively participate in resource design and development. In this construction process, teachers only serve as a guide and resource integrator.

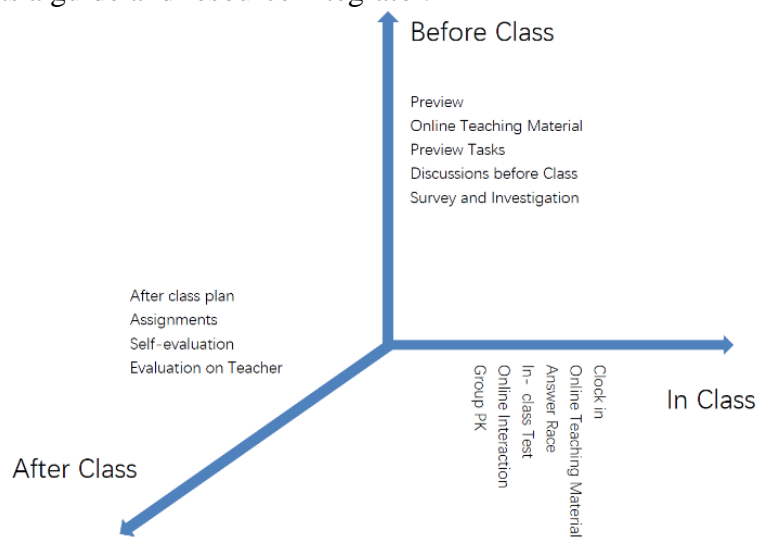


Figure 2. “Cloud Classroom” module

The development and use of learning resources is the process of inputting, processing and extracting resource information. The processing and extraction of resources needs to be measured by the acceptance ability of students. Therefore, the development and use of learning resources should be generated from students' learning outputs: a repeatedly optimized high quality learning resources after understanding, discovery, feedback, screening, and reprocessing.

In order to achieve the ultimate goal that database serves learners, we can work from two perspectives:

4.1 Updating Resources Taking Learners as the Main Body.

Learning resources must be updated and iterated repeatedly. First, teachers should conduct primary design and development of the original curriculum resources according to the syllabus or training plan. The curriculum plan should be formulated based on the curriculum objectives and learners' needs, and initial learning resources such as PPT, test, picture or video resources should be produced and prepared. Then restore the learner's main position in resources update process. The process of learning is the process of reprocessing knowledge. Each learner has a certain difference in the learning process, which reflects the differences in individual cognition, attitudes, and values. Individual learners participate in the learning process and offer personal evaluation and suggestions, which provides teachers with direct learning report. Therefore, teachers could optimize and reprocess the feedback of learners and finally update the resources, as shown in Figure 3. This model requires students to update their resources, which can promote students' active learning and independent thinking skills.

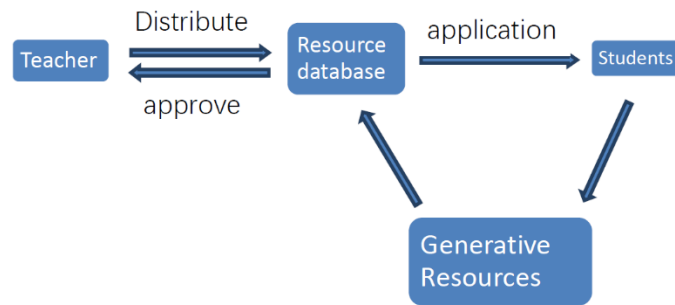


Figure 3. Updating resources taking learners as the main body

Every feedback from students is the process of understanding the re-producing of the teaching content. This feedback resource can be used as the initial resource for next teaching. The next student will then process the feedback according to their own learning situation, thus forming a virtuous circle.

4.2 Updating Resources Based On A Combination Of Teachers And Business Owners.

To maintain good teaching quality, the resource database and platform must be constantly optimized. Only continuous optimization can better serve learning. The optimization of the resource database is guided by the improvement of the acceptance of knowledge and the improvement of teaching efficiency. The platform update is to better adapt to the structure of resources. When resources or platform can't meet the needs of teaching, they need to be updated. From another perspective, this is also a reflection of the life cycle of educational information resources. Every iteration of resource and platform update is equivalent to a "resource metabolism" of a resource system, constantly eliminating obsolete aging resources, absorbing fresh and high-quality resources "nutrients", replacing old resources with new resources and better service learning process.

Teachers should update and support teaching and learning together with resource platforms. Learners participate in the updating of resources as part of the main body to provide next-generation learners with high quality resources. Educational authorities and platform builders should regularly publicize their contributions to society. All these efforts would help to make learning resources truly serve the society and serve lifelong learning

5. Conclusion

As discussed above, a sustainable resource database of dual platform could offer active and efficient solution to build a constructive class. In order to solve long-term problem related to poor quality and low application rate, the key is to involve students in the database construction. Only by this innovation can the online resource database serve classroom teaching well.

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