

Design of a New Integrated Platform for Network Education Based on Mobile Internet

Yang Yang^{1,2,a} and Yangning Zheng^{1,b,*}

¹Bansomdejchaopraya Rajabhat University, Bangkok 10600, Thailand

²Nanchang Institute of Technology, Nanchang 330044, Jiangxi, China

^adx@nut.edu.cn, ^bzyn@nut.edu.cn

*corresponding author

Keywords: Mobile Internet, Online Education, Comprehensive Education Platform, Platform Design

Abstract: "Internet plus teachers" and "Internet plus students" has been studied by many scholars. The development and reform of education and teaching has also attracted the attention of the national institutions of higher learning. The development of the times also urgently requires teaching reform in the field of education and teaching, making full use of modern information technology to actively promote the improvement of the quality of higher education. Based on the background that the Covid-19 pandemic is still completely over, we propose a new online teaching platform covering the whole teaching process, suitable for all kinds of schools, aiming at the various shortcomings of the existing online education platforms. It has modules such as teaching resource management and sharing, quality investigation, classroom teaching, examination management, homework, communication and interaction, and teacher evaluation. We also conducted a sub-module survey on the number of satisfied users in non-level schools, and came to the conclusion that the examination module needs to be improved.

1. Introduction

2022 is the third year Covid-19 has plagued people's lives. In China, although the virus has long ceased to be widespread, there are often a small number of infected people in some areas. In areas with relatively many cases, schools will still stop on-site teaching activities in stages, and instead teach through the Internet. Based on this background, More learners and workplace personnel choose to become their main source of knowledge through the online teaching platform. All colleges and universities are also focusing on developing online teaching platforms suitable for their own curriculum system, so as to become a good supplement for students' extracurricular learning. The online teaching platform system can enrich the educational methods of colleges and universities, so as to improve the utilization rate of teachers' network resources, make rational use of students' learning energy, improve the quality and efficiency of teachers' classes, reduce the

teaching operation cost of schools and reduce the time pressure of teachers. Designing and implementing a reasonable University online teaching platform is an important way to balance teaching and epidemic prevention in the context of the Covid-19 epidemic..

The design of integrated platform based on mobile Internet has been studied by many scholars at home and abroad. Lyapina I survey results show that information technology has become an integral part of society and human life. The new generation of Internet users can't imagine life without new technology and equipment. They are growing. Nevertheless, in the digital environment, modern education can not fully affect the development of human capital. Originality / value - scientific novelty includes research on the importance and Prospect of implementing intelligent technology in the higher education system of the Russian Federation [1]. Vesel a pointed out that the guidelines of educational institutions in developed countries have changed fundamentally. One of the most critical changes is the shift from centralized rational planning to more decentralized governance, composed of different participants and networks. Educational decision makers must be able to steer in a very complex and changeable environment and use different forms of governance tools other than traditional command and control [2].

Online education platforms have been used in China for more than ten years. There are many platforms in the market that have accumulated a large number of users. However, these online education platforms have some problems:

- (1) The functions are relatively scattered, and no platform covers the entire teaching process.
- (2) Lack of ability to control and analyze teaching quality.
- (3) It is difficult to monitor the problem of cheating in exams.

Starting from the actual situation of teaching work, this paper analyzes the functional requirements that the school network teaching platform should meet, analyzes the design of the network teaching platform in detail, and introduces the specific implementation process of the main functional modules in the whole network teaching platform combined with the previous demand analysis and design scheme.

An integrated new platform was developed in response to the deficiencies of existing platforms found in the process of large-scale online teaching in response to the Covid-19 pandemic.

At the same time, a survey and analysis were conducted on the satisfaction of users who used the internal network version of the platform, look for the existing deficiencies and provide the basis for the subsequent launch of the official version.

2. Design of Integrated Platform

2.1. Design Principles of Teaching Mode

(1) Establish a learning model with "cultivating students' ability" and "paying attention to students' personalized development" as the key, pay attention to students' individual differential development, and help them realize the construction of personalized knowledge and the improvement of innovation ability.

(2) Unicom learning must take students as the main body and enhance the process connectivity. In the process of teaching innovation of entrepreneurship education in the perspective of Internet plus, we should strengthen learners' active participation in learning, independent thinking, and personal practice and node connection. At the same time, we should enhance the team cooperation ability training process [3].

(3) Do a good job in the process of teachers' teaching guidance and comprehensively improve students' ability and literacy. Teachers should pay attention to the design of teaching situations and

the arrangement and organization of teaching practice.

(4) Adopt diversified teaching evaluation mechanism. Evaluate students' learning effect and contribution in this field through data tracking [4, 5].

Figure 1 shows the design architecture of the new in-school teaching platform.

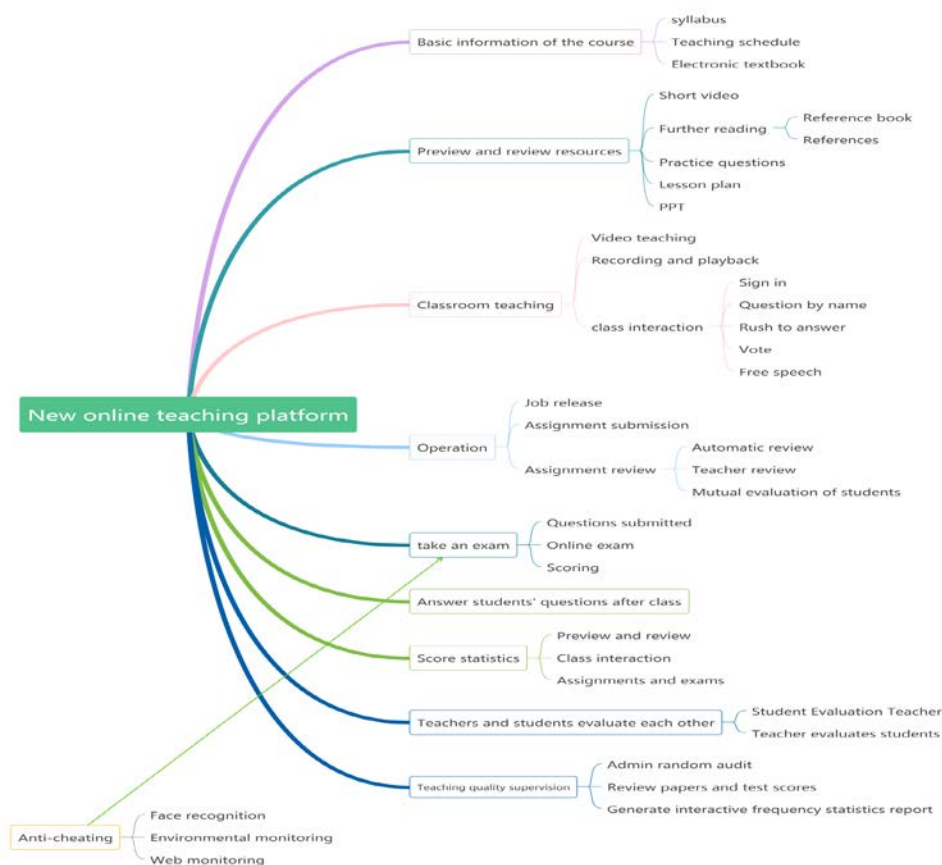


Figure 1: Design architecture of the new in-school teaching platform

2.2. Design of Integrated Platform

2.2.1. Course Basic Information

Before class, teachers prepare lesson plans according to the syllabus and import them into the platform to form an electronic lesson plan. After each class, the system automatically displays the current teaching progress and prompts the teaching objectives of the next class. The basic course information displayed on the platform is conducive to improving teachers' class efficiency.

In addition, teachers can also use the shared resources of other teachers provided by the platform, and teachers who provide shared teaching resources can get corresponding benefits.

2.2.2. Preview and Analyze Resources

After successfully landing on the teaching platform, teachers can independently manage the teaching materials and teaching materials they teach on the teaching platform. The teaching materials of each subject are composed of independent chapters. The section content is the most

basic unit of chapter content, and the section is composed of section content, section difficulties and after-school exercises. The section content is stored in the chapter directory in the form of text, and the section difficulty includes multimedia format files such as teaching video. Through this interface, teachers can add chapter contents and query, delete and modify the added textbook information, which is conducive to preview and analyze resources [6, 7].

2.2.3. Classroom Learning

In addition to the study of basic daily teaching materials, teachers can set up teaching plans according to the knowledge content of this chapter, so as to grant students knowledge in class, timely understand students' mastery of the content of this chapter, and focus on students' weak links in future teaching links [9]. The learning of teaching videos and other materials on the platform, as long as the authorized students are not limited by time and place, they can learn repeatedly when they encounter problems that they do not understand. This advantage is not available in on-site teaching. [8, 9].

In the classroom teaching process, teachers can interact with students by checking in on the PC, initiating quick answers, asking questions, etc., and students can use the mobile phone to respond accordingly.

2.2.4. After Class Q & A

At the end of each course, the system platform will pop up the after-school Q & A interface, where students can timely put forward questions they didn't understand in class, and the teacher will respond in time to improve learning efficiency and promote the communication between teachers and students. The platform has the ability to automatically correct objective assignments. In addition, it can also be divided into different groups for mutual evaluation, so that students can self-evaluate.

Each course has an internal open communication space, which can be accessed by both teacher and student accounts, and its performance is very similar to BBS. The difference between permissions is that teachers can set topics and modify and delete content, but students cannot. Teachers and students can conduct open questions and answers here to eliminate students' doubts.[12].

2.2.5. Job Settings

The job setting interface can be used as the main interface of job setting. In this interface, you can set homework according to the specific course content. After the homework is set successfully, teachers can view the set homework in the homework list interface, and modify and delete the set homework in the homework list interface. Click Manage homework to enter the homework management interface. The teacher extracts the homework from the test question bank to form the after-school practice homework [10]. Teachers can see the completed homework in the homework review statistics interface.

2.2.6. Online Examination

The content of the test must be provided by the teacher, and the way of providing it can be either a finalized test paper or a relatively huge question bank, and the unreasonable test paper can be formed through the corresponding procedures. When students complete the questions within the

specified time limit, they can submit the papers, and then the information is stored in the database, waiting for the teacher to review at the appropriate time. After the students submit the test papers, the test questions will be retained in the evaluation test table. After marking or correcting, the students can also see the test papers that the teacher has circled. Through such online simulation detection systems, the students can grasp their mastery of the classroom in time, so as to improve the students' learning effect and academic performance. After answering, students can directly click the submit button to complete the test and save the test. The answer results will also be automatically stored in the archive table of the test.

The unique anti-cheating function of the exam, which uses target tracking and image processing technology to monitor whether there are other people around the test taker, whether there are other electronic devices, whether to flip books, whether to switch to other pages and other suspected violations of the exam regulations.

2.2.7. Achievement Statistics

One of the functions of the platform is that not all exam situations need to be manually judged by teachers, and many questions with fixed answers, such as multiple-choice questions, fill-in-the-blank questions, judgment questions, etc., can be automatically scored.

If the answer is correct, the score of this question will be displayed next to the test question. If the answer is wrong, the score of this question will be 0. For subjective test questions, such as short answer questions, the teacher can give the subjective score of the question after referring to the standard answers in the database. After the evaluation is completed, the teacher clicks the confirm button, and the total score of students will be calculated automatically after submission. The total score of students consists of objective test score and subjective test score.

After participating in the online examination and successfully submitting the test paper, the students wait for the teacher to review their own test paper. After the teacher's review is completed, the students log in to the teaching platform and enter my test paper interface to see the information of the test paper reviewed by the teacher, including their total score, objective test score and subjective test score. Click the view button, you can also enter the approved test paper page to view the detailed information of the test paper and the statistics of results, such as the score of each test question, the correct answer to the test question, and the teacher's comments [11].

In addition, the interaction and attendance of students in the learning process will also form corresponding data statistics, which can be used as a basis for evaluating course performance.

2.2.8. Mutual Evaluation between Teachers and Students

After the study of the course, students can make comments and suggestions to the teacher, and can choose to sign or not. Teachers can also evaluate students' learning to form course learning comments.

2.2.9. Teaching Quality Management

3. Trial survey and satisfaction analysis

School administrators can learn about teachers' teaching and learning in schools through data analysis and by listening to live broadcasts.

3.1. Research Methods

We were divided into four groups: primary school students, junior high school students, high school students and college students, and conducted a questionnaire survey on the experience of trying the internal version of the platform, the sample size of schools at each level is basically the same.

3.2. Data Collection

This paper mainly uses the questionnaire star to distribute the questionnaire. A total of 380 questionnaires were distributed. Because it has been notified in advance, the efficiency of the recovered questionnaire is 100%.

3.3. Data Processing and Analysis

In this paper, SPSS 22.0 software is used to count and analyze the questionnaire survey results, and conduct Q-test. The Q-test formula used in this paper is as follows:

$$q = \frac{\bar{X} - \mu}{\frac{\sigma X}{\sqrt{n}}} \quad (1)$$

$$q = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2} \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}} \quad (2)$$

Where, formula (1) is a single population test, which is the average number of samples, s is the standard deviation of samples, and N is the number of samples. Formula (2) is a double population test, and the sum is the variance of two samples, and the sum is the sample size.

4. Analysis of Survey Results

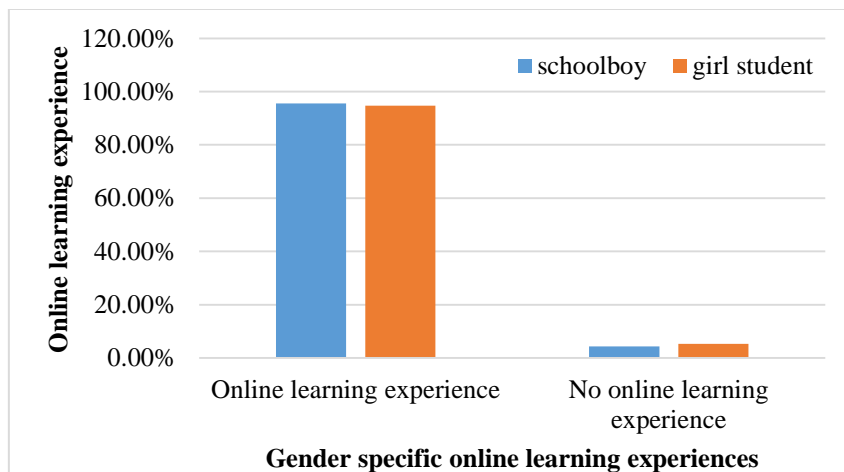


Figure 2: Gender specific online learning experiences

After completing the questionnaire survey, the author uploaded the survey data to the questionnaire star platform to generate the statistical analysis of the survey data. The survey results are shown in Figure 2:

From the cross analysis data of gender factors and Internet learning experience in Figure 2, it is not difficult to see that most people have online learning experience. Compared with the gender data, the gender difference has no significant effect on the online learning experience.

We conducted a satisfaction survey on users of schools with different levels in five dimensions: "Learning Resources", "Interaction with teachers", "homework module", "Evaluate teachers", and "Exam module", get the number of students who are satisfied with each functional module, results are shown in Table 1, figure 3:

Table 1: Data statistics of excitation conditions of interactive behavior

	primary school students	Junior high school students	high school student	university student
Learning Resources	40	36	44	47
Interaction with teachers	33	32	35	34
homework module	12	8	15	10
Evaluate teachers	23	27	27	30
Exam module	25	19	21	23

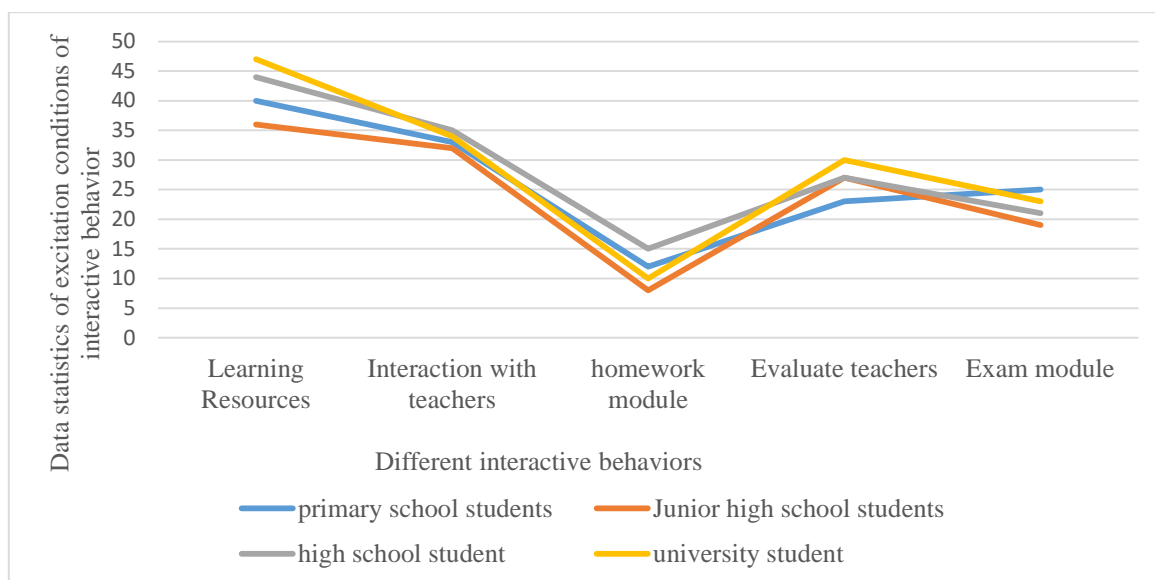


Figure 3: Data statistics of excitation conditions of interactive behavior

In the data statistics of "Satisfaction with the new comprehensive online teaching platform", Respondents at all levels have the lowest satisfaction with the "homework module", which is basically consistent with the conclusion of the interviews with teachers and users. At the same time, respondents from schools of all levels had the highest satisfaction with "Learning Resources", which is also in line with teacher users' views. This shows that in the homework link, the platform still has a lot of room for improvement.

5. Conclusions

"Internet plus education" is based on respecting the laws of education, inject new vitality into it, and fully apply the advantages of Internet technology to teaching practice, thereby improving the quality and efficiency of education. "Internet plus education" is an important strategic plan for the national strategy of "" and "talent power". Good education can enhance the overall quality of the

nation and enhance the competitiveness of the countryA area on professional courses. In the whole research process of this paper, because the test content includes objective questions and subjective questions, the teaching platform can only use manual marking for the latter, and the marking of subjective questions needs to be improved and strengthened. In the whole design process, the self recovery function in case of unexpected conditions in the process of online examination is not considered. The future remains to be studied.

Acknowledgements

Science and Technology Research Project of Jiangxi Provincial Department of Education, China (GJJ171053).

References

- [1] Lyapina I., Sotnikova E., Lebedeva O., et al. *Smart technologies: perspectives of usage in higher education. The International Journal of Educational Management*, 2019, 33(3):454-461.
- [2] Vesel A . *Education officials between hierarchies and networks. Studia Paedagogica*, 2017, 22(2):117-133.
- [3] Weili, Men, Haijuan, et al. *agglomeration effect% cooperation intensity% cooperation network%medical education. Journal of translational internal medicine*, 2018, 6(4):165-172.
- [4] Easter Da Y M W., Gerber E M., Rees Lewis G . *Social Innovation Networks: A New Approach to Social Design Education and Impact. Design Issues*, 2018, 34(2):64-76.
- [5] Schweickert P., Rheuban K S., D Cattell-Gordon, et al. *The APN-PLACE Telehealth Education Network: Legal and Regulatory Considerations. Journal of Nursing Regulation*, 2018, 9(1):47-51.
- [6] Zorzi M., Rover D T., Chatzimisios P., et al. *Telecommunication and Network Engineering Education. IEEE Communications Magazine*, 2019, 57(11):12-13.
- [7] Schweickert P., Rheuban K S., D Cattell-Gordon, et al. *The APN-PLACE Telehealth Education Network: Legal and Regulatory Considerations. Journal of Nursing Regulation*, 2018, 9(1):47-51.
- [8] Maurer H . *Problems and solutions for using computer (networks) for education. Journal of Research in Innovative Teaching & Learning*, 2017, 10(1):63-78.
- [9] Corcoran N., Duane A . *Using enterprise social networks as a knowledge management tool in higher education. VINE Journal of Information and Knowledge Management Systems*, 2017, 47(4):555-570.
- [10] Nagy G J., Cabrera C., Coronel G., et al. *Addressing climate adaptation in education, research and practice: The CliVIA-network. International Journal of Climate Change Strategies and Management*, 2017, 9(4):00-00.
- [11] Carney, Patricia, A, et al. *Advancing Health Professions Education Research by Creating a Network of Networks. Academic Medicine: Journal of the Association of American Medical Colleges*, 2018, 93(8):1110-1112.
- [12] Wang Gang. *Design and implementation of network teaching platform based on .NET [D]. Nanchang University*, 2014.