



# Evaluation of Informatization Teaching Effect by SPSS Under the Background of “Internet+” Big Data

Shu Tang<sup>1</sup>, JinFu Yao<sup>2</sup>, and Le Chen<sup>3</sup>(✉)

- <sup>1</sup> School of Basic Medicine, Shaoyang University, 18 Baoqing West Road, Shaoyang, China  
<sup>2</sup> School of Clinical Medicine, Shaoyang University, 18 Baoqing West Road, Shaoyang, China  
<sup>3</sup> School of Nursing, Xiangnan University, 889 Chenzhou Avenue, Chenzhou, China  
155076837@qq.com

**Abstract.** Objective: To explore the application effect of the informatization teaching mode based on the background of “Internet+” big data preventive medicine. Methods: For 436 third-year students of the 2017 five-year clinical medicine undergraduate major, traditional teaching was adopted as the control group; A total of 436 third-year students of the 2018 five-year clinical medicine undergraduate major were selected for informatization teaching as the experimental group. After the course, through questionnaires and final exam results, using SPSS software, to investigate the learning situation, teaching situation and teaching effect, and compare the course completion scores, course participation, knowledge explanation thoroughness, and classroom binding force of the two groups of students, the strength of answering questions. Results: The experimental group had less extracurricular learning time than the control group, higher degree of participation in the course and clarity of knowledge explanation than the control group, but lower class binding force and no significant difference in problem solving between the two groups. At the same time, the final completion test scores are significantly higher than those of the control group, and the difference is statistically significant. Conclusion: Informatization teaching is very helpful to improve teaching quality. In the future, we should improve and enrich online learning resources, and increase students’ enthusiasm and constraint for online learning. Meanwhile, we should combine the advantages of traditional teaching and informatization teaching to improve the effect of informatization teaching.

**Keywords:** Informatization teaching · Traditional Teaching · “Internet+” Big Data · Evaluation · SPSS · Preventive medicine

## 1 Introduction

With the rapid development of computer technology, network technology, and modern electronic communication technology, the “Internet+” model has widely penetrated into people’s life, work and study. Under the background of “Internet+”, more and more college teachers have begun to explore teaching reform, and the teaching mode has also

developed from single to diversified. From the original traditional teaching mode of explanation, electronic teaching, flipped classroom, online and offline hybrid teaching and other teaching modes have been developed.

Informatization teaching originated from open online courses. However, the early open Online courses only emphasized resource sharing and lacked interaction between teachers and students. Therefore, the early open online courses were not strictly online. The rise of MOOCs has promoted the reform of online education in China, as well as the development of related online education platforms, such as Tencent Classroom, Xuetong, Yuclassroom, Wisdom Tree and other platforms, as well as the online teaching platforms built by each school [2].

Since 2020, with the outbreak and spread of the COVID-19 in various parts of China, the Ministry of Education put forward the requirement of “stop class, but no stop teaching nor stop learning” [4], and universities have opened online teaching.

The traditional teaching method discussed in this paper is based on teaching materials, and students preview before class. In class, teachers mainly explain, supplemented by blackboard writing, PPT, model and other methods, students ask questions and discuss the teaching content, and finally the teacher summarizes. Informatization teaching is embodied in online and offline hybrid teaching, which is online teaching mainly includes teachers recording basic knowledge into videos, or opening MOOCs, SPOCs, online discussions and other online teaching activities. Students watch videos in advance to learn actively, master basic knowledge and concepts, and exercise students’ memory and comprehension ability; offline (in-class) teaching includes classroom teaching, practical teaching, conducting tests, case analysis, group discussions, and other offline communication and other teaching activities [1].

This paper aims to evaluate the effect of the two teaching methods, which is discuss the advantages and disadvantages, and put forward suggestions for the reform of the teaching mode by comparing the two teaching modes of traditional teaching and informatization teaching.

## 2 Information and Methods

### 2.1 General Informations

In this study, the junior students of the five-year clinical medicine major taught by the author were investigated. There are 436 students majoring in clinical medicine in 2017, including 228 boys and 208 girls, aged (20–25) years old, with an average age of ( $22.93 \pm 0.77$ ) years old, all adopt traditional teaching methods. There are 423 clinical medicine students in 2018, Among them, there are 239 boys and 184 girls, aged (20–24) years old, with an average age of ( $22.04 \pm 1.03$ ) years old, adopting the informatization teaching method. There was no significant difference in age and gender between the two groups of students, and they were comparable ( $P > 0.05$ ). All students completed the teaching effect evaluation questionnaire and course completion examination.

### 2.2 Teaching Method

Traditional teaching is based on teaching materials, and students preview before class. In class, teachers mainly explain, supplemented by blackboard writing, PPT, models,

etc., in which students ask questions and discuss the teaching content, and finally the teacher summarizes. Traditional teaching is face-to-face teacher-led teaching [5].

Informatization teaching makes full use of Internet technology. Before class, teachers select or record relevant videos on MOOC, SPOC and other platforms according to the teaching content and teaching objectives, and integrate the main teaching content, teaching focus and teaching difficulty of the class into PPT courseware or video, upload all these materials to various online teaching platforms, and students will carefully preview and complete the pre-class test; use each online teaching platform to teach students live in class, and combine the problems encountered in self-study collected by students before class. The key points and difficult points of the class are explained in a centralized manner, and the communication between teachers and students is realized through the network communication platform, and the feedback from the students is always paid attention to; after the knowledge points are taught in the classroom, the students are organized into groups to practice and discuss, and the post-class test is completed in time. According to the characteristics of the teaching content of each teaching mode, different teaching evaluation methods are adopted [3].

### 2.3 Assessment Methods

The effect of traditional teaching and informatization teaching was evaluated by questionnaire survey and final examination results. Questionnaire survey was distributed and data were collected through the Platform wenjuanxing. The evaluation of course teaching mainly included pre-class preparation and time, after-class review and time, course participation, clarity of knowledge explanation, class binding force, and the strength of answering questions. Score 0–100 points from weak to strong according to how you feel.

### 2.4 Data Analysis

SPSS 20.0 statistical software for data analysis was used for the analysis. The chi-square test is used to compare the enumeration data expressed in rate (%), the test standard is  $\alpha = 0.05$ .

## 3 Results

### 3.1 The Distribution of Extracurricular Learning Time Between Traditional Teaching and Informatization Teaching

In each course, only 28.3% of the traditional teaching students previewed before class, and the average time was about 10.25 min; while 71.2% of the reviewers after class took about 42.12 min. 87.9% of the informatization teaching students previewed before class, with an average time of about 32.75 min, and only 10.6% of them reviewed after class, with a time of about 5.58 min. The details are shown in Table 1.

**Table 1.** The distribution of extracurricular learning time between traditional teaching and informatization teaching [minutes (%)]

	Preview before class	Review after class
Traditional teaching	10.25 (28.3)	42.12 (71.2)
Informatization teaching	32.75 (87.9)	5.58 (10.6)

**Table 2.** Student evaluation of traditional teaching and informatization teaching (points)

	Traditional teaching (n = 436)	Informatization teaching (n = 423)
Course participation	42.32	62.80
Knowledge explanation thoroughness	68.91	65.52
Classroom binding force	87.63	43.74
Strength of answering questions	47.22	49.79

### 3.2 Student Evaluation of Traditional Teaching and Informatization Teaching

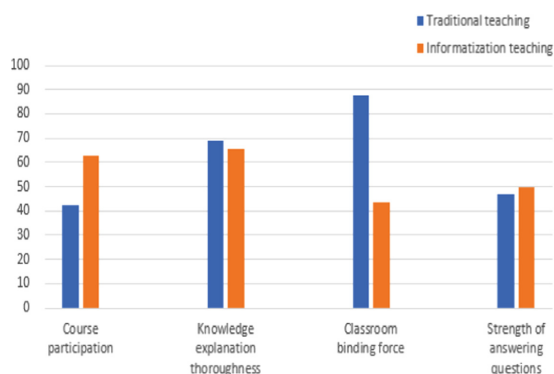
In order to understand students' evaluation of traditional teaching and informatization teaching, the author conducted a questionnaire survey from the aspects of course participation, knowledge explanation thoroughness, classroom binding force, and strength of answering questions. Score 0–100 points from weak to strong according to how you feel.

The degree of participation in the course of traditional teaching and informatization teaching is 42.32 and 62.80, the degree of clarity of knowledge explanation is 68.91 and 65.52, the degree of classroom restraint is 87.63 and 43.74, and the degree of problem solving is 47.22 and 49.79. The degree of participation in the informatization teaching course and the knowledge explanation thoroughness are higher than those of traditional teaching, but the classroom binding force is lower, and the strength of question answering is not much different between the two teaching methods.

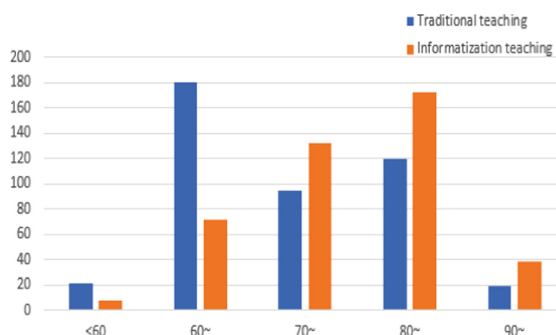
The details are shown in Table 2 and Fig. 1.

### 3.3 Analysis of Students' Performance in Traditional Teaching and Informatization Teaching

According to the analysis of the students' final examination results (100 point scale, the difficulty coefficients of the examination papers all meet the requirements of the university, and there is no significant difference). There were 436 clinical medical students in 2017, 21 failed (<60), 181 passed (60~), 95 were moderate (70~), 120 were good (80~), and 19 were excellent (90~), with an average score of 70.65. 423 students majoring in clinical medicine in 2018, 8 failed (<60 points), 72 passed (60~), 132 were moderate (70~), 173 were good (80~), and 38 were excellent (90~), with an average score



**Fig. 1.** Student evaluation of traditional teaching and informatization teaching



**Fig. 2.** Distribution of final results of traditional teaching and informatization teaching

**Table 3.** Comparison of student achievement between traditional teaching and informatization teaching [points, cases (%)]

Score	Traditional teaching (n = 436)	Informatization teaching (n = 423)
<60	21 (4.8)	8 (1.9)
60~	181 (41.5)	72(17.0)
70~	95 (21.8)	132 (31.2)
80~	120 (27.5)	173 (40.9)
90~	19 (4.4)	38 (9.0)
$\chi^2$	74.560	
<i>P</i>	0.000	

of 77.32. Compared with traditional teaching, the performance of informatization teaching is improved, and the difference is statistically significant ( $P < 0.05$ ).The details are shown in Fig. 2 and Table3.

## 4 Discussion

Since 2020, due to the impact of the COVID-19 epidemic, many teachers have used informatization teaching, which has also led to the development of the informatization teaching model.

It can be seen from this study that traditional teaching is limited in acquiring knowledge based on textbooks, and there is no teacher's guidance, so less time is spent on pre-class preparation and students are used to understanding and consolidating knowledge after the teacher's explanation.

In informatization teaching, teachers have imported videos and quizzes before class. The number of people previewing before class is large, and students spend more time, which makes it easier to mobilize students' initiative. After class, due to insufficient video resources, low innovation in teaching design, network lag, and students' unwillingness to face electronic products for a long time, the student review rate is low. Informatization teaching can interact with teachers online and ask questions in a timely manner, so the classroom participation is high, and teachers can find difficulties and explain them in a targeted manner through the information feedback collected by the pre-class preview, so the knowledge explanation is highly thorough; online courses Students lack supervision, are easily influenced by the surrounding environment, have weak learning persistence, and are less disciplined in the classroom.

Through the analysis of the final exam results of the two classes of students, it is found that the average score has improved, especially the pass rate and the excellent rate, which shows that the development of informatization teaching is very helpful for teaching to improve the quality of teaching.

## 5 Conclusions and Recommendations

Carrying out informatization teaching is very helpful to improve the quality of teaching, but there are still many problems in informatization teaching. The main problems are insufficient video resources, low innovation in teaching design and network lag, students have low binding force and are unwilling to use it for a long time. Electronic product. To this end, firstly, we should improve the online teaching equipment and maintain the fluency of the viewing platform. Secondly, for teachers, the course design should be more reasonable, optimized, and innovative in content to attract students to a greater extent. The design should also consider the students' adaptation time to online courses. According to a survey, the number of online and offline teaching courses offered in each class should be less than 3 per semester, and the weekly online teaching time should be controlled to 3.32 h [2].

To sum up, informatization teaching is conducive to developing students' learning ideas and cultivating students' innovative ability. It stimulates the enthusiasm and initiative of students to learn and improves teaching efficiency.

**Acknowledgements.** Outstanding Youth Program of Hunan Provincial Department of Education (20B520).

Project of Hunan Provincial Social Science Achievement Review Committee (XSP21YBC388).

2020 Hunan University Student Innovation and Entrepreneurship Training Program (3421).

## References

1. Huang RH (2017). The basic pattern of the Internet to promote educational reform. *Journal of China Electronic Education*. (1): 7-16.
2. Liang QQ. (2021). Research and Analysis of Online and Offline Hybrid Teaching Reform. *Journal of Education to Observe*. 10 (33): 107-109.
3. Lv XM. (2019). Exploration of Online and Offline Hybrid College English Classroom Teaching Reform Based on MOOC Internet Platform. *Journal of Information Material Records*. 20 (1): 201-202.
4. Ministry of Education. (2020). Guidance on the organization and management of online teaching in colleges and universities during the epidemic prevention and control. [EB/OL] (2020-02-05).
5. Yang SB. (2010). Reform Traditional Teaching Methods and Cultivate Innovative Talents. *Journal of Business Herald*. (4): 215-216.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

