

Quality Assurance Issues and Solutions in Higher Education Online Systems

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Abstract. Under the current background of the pandemic and "Internet + education", how to effectively ensure the effect of online teaching is a challenge for many educators. This paper aims to analyze and summarize major elements relating to online teaching quality assurance. Four key strategies have been proposed including instructing teachers for online/hybrid course development, training teachers for a virtual class, improving student support and service system for online learning and establishing teacher performance evaluation system. The Research provides guidance for ensuring the quality of online education in colleges and universities.

Keywords. Quality assurance issues; Online teaching; Higher education

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1. Introduction

The technological advances of the past several decades have meant remote or online education is now a credible alternative of face-to-face learning. Online education frequently applies to university systems and provides flexibility in time and costs for students [1].

Digital resources which are stored and shared among a learning community can enhance student collaboration, especially in group or project-based learning settings. From the student perspective, online learning eliminates geographical barriers and enables continuous and almost unrestricted access to information and knowledge [2]. There are advantages of online education from the viewpoint of teaching staffs as well. It facilitates the testing and assessment of students' skills and competencies and online technologies enhance communication among all course participants, both teachers and students [1].

The spread of the covid-19 has created the largest ever disruption of education systems. According to the statistics, approximately 1.6 billion learners in more than 190 countries all around the world have been affected [4]. Universities in China are preparing for a possible long-term discription of attendance and already well advanced in providing a large share of its students with access to online learning opportunities [1]. However, Online teaching is very different from the conventional form of

education. The simultaneous launch of large-scale online education poses new challenges to quality assurance (QA) of teaching. The impact of pandemic on higher education and quality assurance has already elicited national attention and discussion. Research shows that many problems such as unsophisticated teaching platform, the diversified teaching effect, inconsistent performance measurement criteria and ineffective quality assurance system have arisen due to the rapid and sudden transition of nearly all courses at most institutions in an online environment [4],[6]. Based on the literature review of effective online teaching and quality assurance, this paper proposes a quality assurance system for online education in colleges and universities with four following strategies combining with the experiences of large-scale online teaching in recent years:

- Guidance for Online/Hybrid Course Development
- Training Teachers for a Virtual Class
- Improving student support and service system for online learning
- Establishing teacher performance evaluation system

2. Guidance for Online/Hybrid Course Development

Teachers play vital roles in developing online higher education and are responsible for helping students to understand the key sections of an online course. Online education is not simply recording a video of a teacher's lecture in the classroom, and then put it directly on the internet platform for students to watch. Online education requires teachers to adapt to new forms of teaching in terms of the presentation of teaching content, the selection of teaching methods, as well as the distribution and correction of teaching assignments using innovative technologies and models. These technologies include two aspects: one is the operation of human-computer interaction; the other is the teaching process based on human-computer interaction. The new teaching model is unfamiliar to teachers and requires numerous time and energy to study. Therefore, training teachers to develop online courses is essential.

Universities should establish a special department to guide teachers to develop online courses. It helps teachers to design online courses and provide online teaching technology and resources [7]. State University of New Jersey in the USA sets up at least three stages for teachers to start online and hybrid courses as follows:

Stage1 Basic conditions. Teachers first need to obtain an Online Teaching Certificate to develop online courses.

Stage2 The course development preparation process. It includes: involvement of teachers in the design and implementation of online learning and clarifying their responsibilities for curriculum development; understanding and approving the development of this online course by the head of the department chairs; application of course development program funding and working with online course designers to develop a MoU/agreement.

Stage3 The actual development process of the curriculum: Faculty collaborate with instructional designers on course development and the curriculum should be examined according to specific criteria. Online courses established by teachers need to be approved by the school. After approval, the online course can finally enter the study plan and become an official one.

3. Training Teachers for a Virtual Class

In recent years, the government has paid great attention to the development of teachers' online teaching ability and cultivating teachers' online teaching skills. Training also should focus on psychological awareness of teachers. Online skills training aims to improve teachers' ability to use the Internet flexibly, and empower teachers to use the Internet for course innovation at the same time. It ensures the smooth progress of teaching, and also promotes the diversified development of online courses. Psychological awareness training aims to give online teachers more psychological and

awareness support because there are obvious differences in teacher-student interaction between online education and face-to-face education [8]. The related interaction and feedback forms are also quite different between.

In order to effectively improve teachers' online teaching capability through training, it is necessary to formulate a set of performance measurement standards and design an effective training system accordingly [9],[10]. The Technological Pedagogical Content Knowledge (TPACK) framework is the foundation for teachers to carry out effective teaching under the background of current educational digitalization.

The TPACK framework was first proposed by Punya Mishra and Matthew J. Koehler of Michigan State University in 2006. This framework suggests seven elements of knowledge needed to successfully integrate educational technology, including pedagogical content, technology, pedagogy, content and knowledge (Figure 1). Among them, Technological Knowledge (TK), Pedagogical Knowledge (PK) and Content Knowledge (CK) represent knowledge about technology, pedagogy and subject content respectively, and are in a dominate position. Each domain also intersects with the other ones. The knowledge, skills, and abilities developed where all three domains overlap and integrate cohesively is referred to as TPACK and forms the basis for effective technology integration [9],[10].

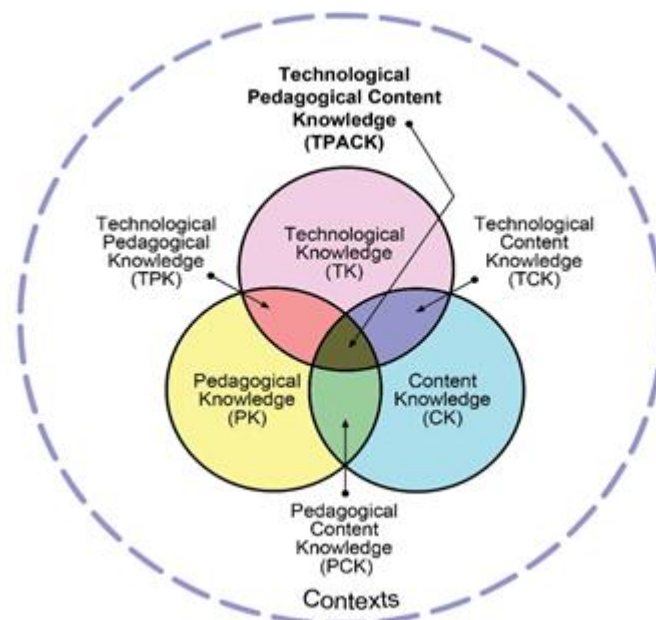


Figure 1. Framework for Integrating Educational Technology (Content, pedagogy, and technology integration) [11]

The application of TPACK defines the relationship between information technology and education in the new era, offers a new perspective for repositioning and developing the professional quality of teachers and provides a reasonable solution to the problems existing in the deep integration of information technology and education in the information age. Furthermore, the complex interaction between subject knowledge, pedagogy and technology in curriculum integration provides a solid theoretical foundation for exploring practical teacher professional development.

As a result, the development of teacher education should pay great attention to TPACK, and its

effect has gradually become prominent. TPACK research at home and abroad has effectively promoted the development of teachers' knowledge structure and the progress of teachers' technical practice ability in the field of education. Large-scale online teaching these days provides a new practice field for the development of TPACK for college teachers as well.

4. Improving student support and service system for online learning

Course service is one of the important quality concepts of online learners, and is essential to improve the overall quality of online education. The system of student support and services plays an important role in safeguarding students' physical and mental health and enhancing the student's study experience. For example, University of Plymouth in UK has launched a "digital café" platform for online students to book an appointment with psychologists who provide one-on-one counselling and coaching. The data shows that the number of students seeking psychological support has increased by 50% compared with offline since the implementation of the "digital cafe" which helps alleviate the impact of isolation and loneliness during the epidemic. Therefore, the mental health problems of students have been reduced due to the particularity of online education. Student support and services system should also focus on students with special educational needs and learners from non-native speaking countries. In order to avoid that the progress of the course is affected by language problems, universities can provide free language lectures and thesis polishing services for international students [12].

Building an online learning community is also important for student support and service systems. Ensuring the successful implementation of online higher education requires the use of digital technologies to build a high level of trust between teachers and students. However, the Internet has drastically reduced opportunities for informal interaction between them. The social and cultural differences have hindered the construction of online communities and the concept of "online community" has been proposed to overcome this problem. This concept comes from the theory of social learning which emphasizes social constructivism and real problem-based learning, and highlights the importance of social dynamics in the learning process. The construction of an online study community has raised higher requirements for online educators. First, the construction of an online study community requires teachers to reconsider the way classrooms are organized, and must fully consider the positive role of social media in the construction of learning communities, rather than just copying the teaching model of offline courses. Second, teachers should maintain the social structure of schools and communities as part of online education. Finally, teachers should also take the interaction between teachers into account in the process of building community. In order to better build an online study community and improve the quality of online education, a toolkit of remote education needs to be provided to educators with advice on classroom organization and technology use[12].

5. Establishing teacher performance evaluation system

The traditional face-to-face teaching performance evaluation system mainly assesses students' homework, attendance, learning attitude and grades from the perspective of teachers. The evaluation system is relatively simple and cannot be applied directly to measure the overall process of students' online learning. Build a comprehensive online evaluation system composed of college supervisors, teachers and students that runs through the pre-class, in-class and after-class, and consists of multiple evaluation subjects is very important. A multi-dimensional online teaching and learning performance evaluation system should be carried out for students' learning attitudes, learning methods, learning abilities, teacher-student interaction, and learning detection. The system can improve both teaching and learning, solve the problems existing in the evaluation of online teaching and learning effects, and achieve good learning results [13].

The evaluation system includes three diversified evaluation subjects: teacher evaluation, student

evaluation and teaching supervisor evaluation. Teacher evaluation in terms of online teaching preparation, implementation and feedbacks can find teachers' own shortcomings, and constantly improve teaching quality and ability. Students, as participants of online teaching, can conduct online teaching evaluations on teaching contents, teaching methods, teaching effects, and teaching organizations. From the student's point of view, whether online teaching has strong attractiveness to ensure students' participation in the whole process, and whether teachers can effectively enhance students' sense of belonging in the classroom during the teaching process, are the key points of student evaluation. As the administrator of online teaching, school appointed supervisors can conduct online teaching evaluations in terms of teaching plan design, teaching implementation process, teaching effect, and teaching resources. From the viewpoints of experts, the main focus is on whether teachers can carry out reasonable teaching design according to the characteristics of online teaching [13].

The evaluation system contains three stages: Pre-class evaluation, In-class evaluation and after-class evaluation. The pre-class evaluation is mainly to check the students' self-learning state. Through the preview test arranged before the class, the teacher understands the students' understanding of the knowledge points and clarify the key and difficult teaching points. The pre-class evaluation methods can be knowledge points self-assessment, case analysis and viewpoint explanation. If the students complete the overall answer with a high accuracy rate and only a few students make mistakes, it indicates that the students have basically understood the knowledge. On the other hand, if only a small number of students answered correctly, the teacher needs to analyse the reasons why most of the students answer incorrectly. By examining the different learning conditions of students, teachers can more accurately design and carry out teaching activities in class [14].

In-class evaluation is the most intuitive feedback on the learning effect and the assessment methods that can be used in the in-class evaluation diversely, such as online check-in, continuous questionings, group discussions, online voting, coursework displays and quizzes. Specifically, main knowledge points can be evaluated using questionings and quizzes. In-class evaluation is the most important and complex part of the online teaching evaluation process. In the online teaching process, teachers give feedbacks on learning effect evaluation according to different knowledge types, teaching objectives and teaching activities. Using the evaluation feedbacks in class, teachers can adjust teaching activities in time and improve the quality of online teaching.

After-class evaluation is the link between the previous and the next online teaching sections. Through the quantity and quality of homework completed, teachers can control the students' learning effects. The evaluation criteria that teachers can choose include the viewing time of the video, the number of clicks on handouts, the timeliness of the assignment submission and the accuracy of the self-assessment questions. Using the online platform, all evaluations can be summarized and analyzed with quantitative and qualitative methods which will help teachers to fully understand the effect of online teaching and learning [13].

6. Conclusion

Under the background of the epidemic, the full launch of online teaching in China is critical for emergency management in education, and it also creates both opportunities and challenges for education informatization. The popularization of high-quality online teaching is an inevitable trend of future educational development. The study provides an overview of four strategies relating to build up a quality assurance system for online education in colleges and universities. The training program and guidance's for online course development should be provided to teachers and student support system and teacher performance evaluation system should be established in order to guarantee excellence of online education. Future research can explore other policies and issues that are important for distance learning quality assurance. Research can also examine the influencing factors of online teaching effect from the perspective of students.

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