

Development of the Online Teaching Maturity Model in Open Education

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Abstract. To improve the teaching quality provided by open education in China, this study developed a maturity model addressing the five perspectives of open education: teaching environment, teaching context, teaching resources, teachers and learners method. Afterwards, we examined the scientific validity of the model by evaluating the maturity of online teaching of Beijing Open University through survey data collection. Our evaluation indicates that the overall maturity of Beijing Open University remains at a basic level. From a theoretical perspective, the present study enriches the research on online teaching quality in the field of open education and provides new research ideas for the comprehensive evaluation of the online teaching quality of open university. The research conclusions have certain practical reference value for the improvement of online teaching quality in open education.

Keywords: online teaching; maturity model; open university.

1. Introduction

In 2019, the sudden outbreak of COVID-19 around the world caught all sectors by surprise. However, education may have been the least affected, especially open university, which has experienced little impact from the epidemic because of its reliance on online distance education, describing those formal teacher-learner arrangements in which the teacher and learner are geographically separated most or all of the time, and the communication between them is through a technology medium such as a computer or video (Verduin & Clark, 1991[1]). Universities around the world have also rapidly switched to online teaching, with some students never stepping on campus after the outbreak but still guaranteed to complete their studies. The digital transformation of teaching has attracted increasing attention from education practitioners worldwide. Online teaching has become an important means in the post-epidemic era and will no longer be the patent of open university.

As an important provider of national continuing education, the Open University of China was the earliest practitioner of online teaching in China, providing higher education opportunities and resources to the population. It has trained 15.59 million college graduates and conducted hundreds of millions of non-academic social education and training programs. However, unlike open universities abroad such as the Open University of the Netherlands or the Open University in the United Kingdom which are widely known and have good social reputations, the open university within China has always been believed to be taught by lesser staff, and a way to supplement a bachelor's degree but not a valid or valuable source of knowledge. Thus, the quality of online teaching in open university has been always questioned from the beginning. Why is the first digital transformation of education taking place without quality teaching?

In view of the above, this study developed a maturity model to evaluate the status of online teaching in open university. Beijing Open University was used as an example to verify and evaluate the online teaching maturity model. Identifying the current online teaching development level and existing problems, theoretically expanding the international maturity model to evaluate its applicability to China Open University online teaching, and further improving the quality of open education all have important theoretical and practical significance.

2. Literature review

Scholars have conducted several studies on quality issues in distance education. In recent years, the maturity model has been attracted more attention. Maturity models are used for the comprehensive evaluation of activities, processes, technical skills, or other objectives (Blondiau, Mettler, & Winter, 2016 [2]; Mettler, 2011[3] ; Reis, Mathias, & de Oliveira, 2017[4]). The concept of maturity in the field of education reference began with the e-learning Maturity Model (eMM), proposed by the University of Victoria in New Zealand (Marshall, 2004[5]) and used to assess the quality level and ability of educational institutions to implement online learning (e-learning).

Overall, maturity models have not been well studied (Sanchez Puchol et al., 2018[6]). Furthermore, few studies have specifically targeted open university for a comprehensive evaluation using them. In order to address these limitations, we first constructed a maturity model suitable for online open university teaching based on the theory of knowledge transfer, and Beijing Open University was used as a case for verification. The present study not only theoretically adds to existing research on maturity models, but also provides a new theoretical research framework for the quality evaluation of online teaching in open education. In practice, what we concluded provides more systematic information for all participants in online teaching and a reference for future practice optimisation.

3. Development of an online teaching maturity model

3.1 Evaluation levels

Contrary to ordinary universities, open university was designed for online teaching. Therefore, when evaluating the maturity level of open university, the ‘no performance’ or initial level does not have much significance and can be removed. Accordingly, our open university online teaching maturity model included four evaluation levels: level 1 or ‘basic level’, which indicates there is certain information technology input on online teaching available; level 2 or ‘application level’, which means that the available information technology has been applied in practice; level 3 or ‘change level’, which indicates the integration of information technology and online teaching; and level 4 or ‘optimisation level’, which indicates more timely adjustment between available information technology and online teaching for improved teaching effect. To move to the next, higher level, scores must be more than 60 points.

3.2 Evaluation dimension

Online teaching is also essentially a process of knowledge transfer, which is inseparable from teaching channels, contexts, knowledge taught, teachers, and learners. However, it should be noted that the online teaching process should not completely copy the concept of knowledge transfer as it originated among enterprises but should instead be analysed in detail. Online teaching channels involve online teaching platforms, such as Moodle or Tencent’s live platform. The use of the teaching platform, regulation, and related system environment support will directly affect teacher and learner experiences. Therefore, it is essential to pay attention to these and other online teaching environments (TE).

Regarding the online teaching context (TC), there is a time and space dislocation between teachers and learners in online teaching. During the process of live broadcast or recorded teaching, teaching contexts (especially interactive situations, which are created by teachers or naturally occur) have different effects on interactors and interactive results. Focusing on the teaching context means paying attention to the specific knowledge transfer process from teachers to learners with the help of online teaching tools.

Online teaching resources (TR) include network education and environment resources especially for network learners, teachers, and others, which are developed and maintained by certain

technologies. Online teaching resources take a variety of forms; they are easy to download and share, immediately available, interactive, and rich with teaching opportunities. Online teaching resources are key elements for teachers to transfer knowledge to learners.

Teachers and learners are the two participants of online teaching. Teaching methods (TM) and learning methods (LLM) directly reflect the improvement process of teaching and learning behaviour with the support of information technology. The learning method is also divided into three stages, starting with inductive learning based on observation, participating in intentional and deliberate practice, and finally ending with challenging self-study. The corresponding stages reflect the cooperation of teachers and learners to achieve a higher level of teaching interaction.

To sum up, teaching environment (TE), teaching context (TC), teaching resources (TR), teaching method (TTM), and learning method (LLM) are the inevitable five elements of online teaching knowledge transfer, and they work together to promote the integration of information technology and teaching. Thus, our model uses these five dimensions to measure online teaching maturity.

3.3 Key process domains and their key practices

Each dimension contains 4 key process domains and several key practices to achieve each evaluation level(see Table 1).

Table 1 Evaluation dimensions, key process domains and key practices of Open University

Evaluation dimension	key process domains
Teaching Environment(TE)	TE1: School Policy Support TE2: Equipment and practicability of Teaching Hardware Equipment TE3: Monitoring and Evaluation Support for Teaching Related Reform TE4: Continuous and Intelligent Transformation of the Teaching Environment
Teaching Context(TC)	TC1:Building of learning scenarios on the platform TC2:Convenience of Course learning scenarios on the platform TC3:Active construction of Learning context TC4:Continuous Application Learning context
Teaching Resource(TR)	TR1:Teaching Resources Allocation TR2:The Resource Content is Practical TR3:Resource content novelty TR4:Resource regeneration and Improvement
Teacher Teaching Method(TTM)	TTM 1: Demonstration Teaching TTM 2: Teaching by Various Information Technology Methods TTM3: Flexible, Informal Teaching TTM 4: Continuous Use of New Technologies to Promote Teaching Effect
Learner Learning Method(LLM)	LLM1: Acceptance Learning LLM2: Active Participating Learning LLM3: Deep Significance construction LLM4: Informatization Consciousness and Innovation

4. Verification and application

4.1 Questionnaire design and measurement

To evaluate the maturity level of the online teaching available at Beijing Open University, we developed a questionnaire measuring the model's dimensions, domains, and practices.

We collected 220 valid questionnaires (including 61 teachers and 159 learners) from September 2021 to February 2022. Among the teachers, 82% had middle and senior professional titles, and 80% were full-time teachers, which is representative of the teacher population to a certain extent and meets the requirements of the sample in this survey.

4.2 Model verification

To verify the accuracy of the maturity model, model reliability and validity tests were conducted with the use of the software SPSSAU. We used the combined reliability value (composite reliability, CR), which is not easily affected by the number of questions, the correlation between questions, the size of subject trait variation, or the difficulty of question items. The result shows that the CR values were all above 0.5, and that the reliability of the model was good according to Kline's criteria. Comparing the square root (diagonal value) of the AVE value of the variable with the variable itself the former was greater than the latter, indicating that the differential validity between the items was high.

4.3 Results

The statistical analysis results (Figure 1) showed that, overall, online teaching at Beijing Open University is still at the basic level. The reason for this was that the learning method was still at the basic level, lowering the overall maturity rating; additionally, the teaching method was only one level higher at 'application'. Teaching environment and teaching context were at the change level, while teaching resources were at the optimisation level.

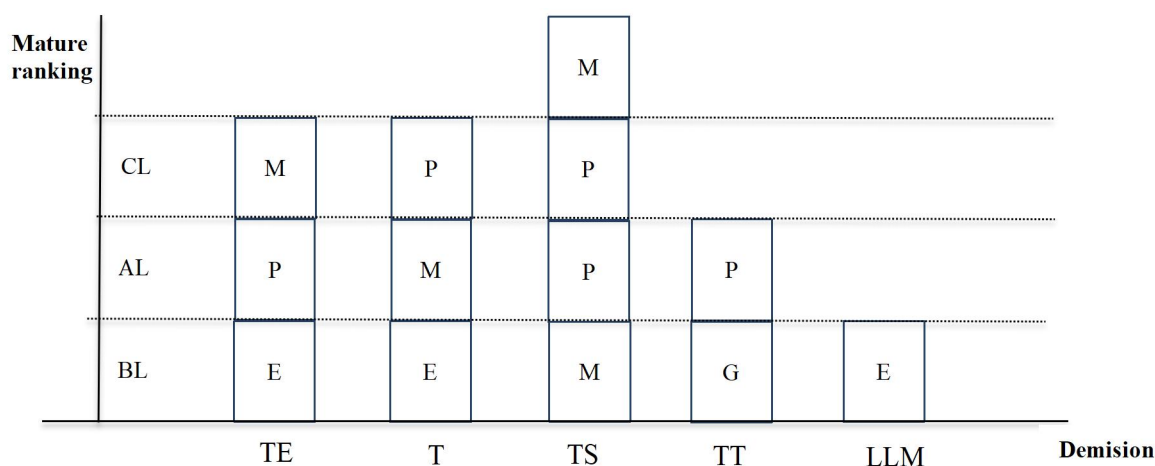


Figure 3 Map of online teaching maturity rating Of Beijing Open University

Note: 1.mature ranking: BL-basic level; AL-application level, CL-Change level,OL-Optimisal level;
2.P: pass (60-70 scores) ;M : medium (70-80 scores), G:Good(80-90 scores); E:excellent (above 90 scores).
3.TE-teaching environment, TC-teaching context, TS-teachhing resource, TTM-teacher teaching method,LLM-Learner learning method.

5. Conclusion

Based on the knowledge transfer theory, a maturity model was developed and applied to evaluate the online teaching maturity of Beijing Open University, and the following conclusions were drawn.

Firstly, according to the comprehensive evaluation using the maturity model, the overall maturity of Beijing Open University is still at the basic level, and the overall integration of information technology and course teaching is in the initial stage of implementation. Secondly, in relation with the various dimensions, teaching resources reached the optimisation level, the highest rating, followed by the teaching environment and teaching context, which were at the change level. Thirdly, from the perspective of each dimension's development level, teaching environment, teaching context, and learning method reached excellent scores at the basic level, teaching environment and teaching context stand at the same change level, while the former developed to a medium degree, the latter was still at a lower one.

The maturity of online teaching reflects the integration process of informatisation and teaching and its effects. Our findings provide some research inspiration for the integration of open education informatisation and teaching. Future research will continue to optimise maturity measures and expand open university cases to further explore the relationships between these dimensions.

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