

Literature Review on Research on Online Teaching Effectiveness Evaluation Based on the Kirkpatrick Model

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ABSTRACT

With the rapid development of online teaching, how to effectively evaluate the effectiveness of online teaching has become an important issue. The current research status of online teaching effectiveness evaluation based on Kirkpatrick model was summarized, the research status, research contents and shortcomings in this field were discussed, and the direction and significance of future research was pointed out. Through analysis, it is believed that although the research on online teaching effectiveness evaluation based on Kirkpatrick model has achieved certain results, there are still many shortcomings that need to be further explored and improved.

Keywords: Kirkpatrick model, Online teaching, Effectiveness evaluation, Literature review

1. INTRODUCTION

In the context of the continuous development of educational technology, online teaching has become an increasingly important form of education. How to evaluate the effectiveness and quality of online teaching has become an important issue in education. Kirkpatrick model is a method for evaluating the effectiveness of training programs and is also widely used in the evaluation of online teaching effectiveness. This article will summarize relevant research on online teaching effectiveness evaluation based on Kirkpatrick model at home and abroad, and explore future research directions.

2. OVERVIEW OF KIRKPATRICK MODEL

Kirkpatrick model[1], proposed by Donald L. Kirkpatrick, includes four levels: the reaction level, the learning level, the behavior level, and the outcome level. The reaction level focuses on students' satisfaction and feedback on the training; the learning level focuses on the knowledge, skills, and abilities acquired by students during the training; the behavior level focuses on the behavioral changes of students after the training; and the outcome level focuses on the impact of

training on the personal and organizational performance of students. These four levels provide a comprehensive perspective for evaluating the effectiveness of online teaching.

3. RESEARCH METHODS

In this article, literature research method and visual analysis software are mainly used. CiteSpace is used to draw a knowledge map of the relevant literature retrieved, and the keyword co-occurrence map is made to have an in-depth analysis and explore the main content, research characteristics, and existing weakness of existing research on online teaching effectiveness evaluation based on Kirkpatrick model at home and abroad.

4. LITERATURE RESEARCH

Advanced searches have been conducted on the Chinese general database of CNKI's "Journal" and Wanfang Data's "Journal Papers" for relevant literature on December 26, 2023 without time limitation. The matching type was set to "exact", and the search term was set to TS=(Kirkpatrick* Model)AND TS=(online teaching) AND TS=(evaluat*) and "TS=(Kirkpatrick* Model)AND TS=(online teaching) AND TS=(assess*)".

The source of English literature data retrieval is the Web of Science core collection, with the document type of "Article" or "Review", the language of "English", and the search time from January 1, 2015 to November 25, 2023. The author searched for literature on online teaching effectiveness evaluation based on Kirkpatrick model with the terms "TS=(Kirkpatrick* Model)AND TS=(online teaching) AND TS=(evaluat*)" and "TS=(Kirkpatrick* Model)AND TS=(online teaching) AND TS=(assess*)".

4.1 Relevant Research in China

There are not many studies on the application of Kirkpatrick model in online teaching effectiveness evaluation in China, with only 15 relevant articles retrieved.

Existing domestic research has used Kirkpatrick model to evaluate the effectiveness of online teaching, focusing mainly on student response, learning outcomes, and behavioral changes. For example, Yang[2] explored the performance evaluation method of online learning for continuing education for primary and secondary school teachers through case studies in economically underdeveloped areas of China. She found that online learning performance evaluation can help improve teaching quality, promote teacher professional development, and optimize resource allocation. Wu[3] constructed and explored an online teaching training evaluation system for university teachers. They believed that the evaluation system should include multiple aspects such as training objectives, content, methods, and effects, and emphasized the diversification of evaluation subjects and methods. Through case analysis, they found that the evaluation system could effectively improve teachers' online teaching ability. Su[4] studied the evaluation of online teaching effectiveness based on Kirkpatrick model. They found that through reasonable evaluation methods and indicator systems, it is possible to comprehensively understand students' learning outcomes and behavioral changes, providing a reference for improving teaching methods and optimizing teaching resources.

Xiang and Hu[5] explored the design and application of a practical assessment framework for quality control circle training. By establishing a comprehensive assessment framework, they aimed to improve the quality and effectiveness of practical training. The framework includes training

objectives, assessment standards, implementation plans, and other aspects, and emphasizes the importance of continuous improvement. Zhang[6] conducted an evaluation study on the online teaching effectiveness of college physical education. He found that through reasonable online teaching design and evaluation methods, it can effectively improve students' learning outcomes and satisfaction. At the same time, he also raised some issues and challenges that need further research and improvement. Gong and Chen[7] evaluated the mixed teaching effectiveness of landscape architecture design based on Kirkpatrick model. They found that mixed teaching can effectively promote students' learning outcomes and behavior changes, while improving teaching quality and effectiveness.

Other studies have also involved evaluating the effectiveness of online teaching in different fields and for different audiences. These studies have used Kirkpatrick model as a theoretical foundation, and measured the effectiveness of online teaching through evaluating the participants' responses, learning outcomes, and behavioral changes.

4.2 Relevant Research Abroad

25 valid English documents were retrieved. The visualization analysis diagram of keywords with CiteSpace showed that the parameters were set as follows: time span from January 2015 to November 2023; 1 year as the value of time slice, including 121 nodes and 409 connections, with an overall network density of 0.0563. The nodes are relatively sparse in distribution, reflecting the lack of breadth and depth in research on online teaching effectiveness evaluation based on Kirkpatrick model abroad.

Modularity $Q=0.7755$ indicates that there are some specific research themes or fields regarding online teaching effectiveness evaluation based on Kirkpatrick model in foreign countries, and the research within these themes or fields is closely connected, while it is relatively independent from research in other fields. Weighted mean silhouette $S=0.9531$ indicates that there is a high degree of similarity and consistency among the studies based on Kirkpatrick model in foreign countries. Harmonic mean $(Q, S)=0.8552$ is the harmonic mean of Modularity Q and Weighted mean silhouette S , which combines the information of the two indicators. The value is around 0.85, indicating that the research based on Kirkpatrick model in

foreign countries has both high modularity and high node similarity.

Through research on the retrieved literature, it was found that online teaching effectiveness evaluation based on Kirkpatrick model has been widely applied in foreign research. This model is used to evaluate online teaching effectiveness in different fields and for different objects, including university teachers' blended teaching efficiency, English as a medium of instruction (EMI) training programs, anatomy education, online learning experiences for health science students, and interprofessional education in pharmacy schools.

Liang[8] used Kirkpatrick model to evaluate the efficiency of blended teaching for university teachers, proposing an evaluation method based on Kirkpatrick model, including four levels and corresponding evaluation indicators. They found that this evaluation method can effectively measure the teaching efficiency of teachers in blended teaching mode. Wu[9] used information and communication technology to promote the development of new teachers, and adopted Kirkpatrick model to evaluate teachers' response to professional development courses, learning outcomes, and behavioral changes in practice. Ismaili[10] evaluated the application of information and communication technology in secondary and higher education projects, taking the GENIE project as an example. The study used Kirkpatrick model to evaluate the effectiveness of online teaching, and found that students had positive feedback in terms of technology and learning outcomes.

Zhao[11] used Kirkpatrick model to evaluate the effectiveness of an English as a medium of instruction (EMI) training program and found that the training program had achieved significant results in improving the trainees' English proficiency and teaching skills.

Torda[12] used virtual reality technology to integrate medical ethics into clinical decision-making, and applied Kirkpatrick model to evaluate participants' reactions and learning outcomes to this teaching method. Yunus[13] used surgical skills workshops to teach basic surgical skills, and used Kirkpatrick model to evaluate participants' behavioral changes and final learning outcomes after the workshops.

Pagnucci[14] focused on continuing professional development in the field of long-term care and evaluated the effectiveness of online teaching using Kirkpatrick model. This study

demonstrated the effectiveness of online teaching for continuing professional development and provided suggestions for improving teaching. van Tuijl[15] evaluated a six-year training course for healthcare professionals and used Kirkpatrick model to measure participants' response to the course, learning outcomes, and behavioral changes in practical work. Seneviratne[16] conducted a systematic review aimed at understanding the characteristics and outcomes of community health worker training.

In addition, Depasquale[17] conducted a cross-sector study to understand the situation of interprofessional education in pharmacy schools in the United Kingdom. They used Kirkpatrick model to evaluate the effectiveness of interprofessional education and found that the education can improve the quality and efficiency of pharmaceutical services.

5. RESULTS AND DISCUSSION

The results of this study show that online teaching effectiveness evaluation research based on Kirkpatrick model involves multiple aspects, including online teaching, Kirkpatrick model, and online teaching effectiveness evaluation. These studies demonstrate the effectiveness of Kirkpatrick model in different fields and different types of educational programs, providing important guidance and inspiration for quality assurance and management of online teaching.

5.1 Research Contents

In terms of online teaching, the research involves the basic concepts, characteristics, development history, and current status of online teaching. These studies provide important theoretical foundations and practical guidelines for a deeper understanding of online teaching. At the same time, it also includes research on online teaching platforms, teaching models, teaching resources, and other aspects, providing useful references for improving the effectiveness and quality of online teaching.

Kirkpatrick model, a classic teaching effectiveness evaluation model, includes evaluations of cognitive, affective, and behavioral aspects. Many scholars have conducted in-depth research and discussions on Kirkpatrick model, and have proposed a series of improvements and refinements. These studies provide important

theoretical and practical guidance for further optimizing and improving Kirkpatrick model.

Research on evaluation indicators, methods, and models for online teaching effectiveness has been conducted in terms of online teaching effectiveness evaluation. Many scholars have proposed online teaching effectiveness evaluation models based on Kirkpatrick model, and conducted empirical research and application on them. These studies provide effective evaluation tools and methods for the effectiveness and quality of online teaching.

In summary, it has been found that the research on online teaching effectiveness evaluation based on Kirkpatrick model involves multiple aspects, which provide important guidance and inspiration for the quality assurance and management of online teaching. Future research can further explore how to effectively use Kirkpatrick model to evaluate various types of online learning outcomes, and explore how to combine Kirkpatrick model with other evaluation tools to provide more comprehensive and accurate evaluation results. At the same time, it is also necessary to strengthen the quality assurance and management of online teaching, and improve the effectiveness and quality of online teaching.

Kirkpatrick model plays an important role in evaluating the effectiveness of online teaching. Through the evaluation of online teaching based on Kirkpatrick model, we can conduct a comprehensive, objective, and scientific assessment of all aspects of online teaching, and then propose corresponding improvement strategies.

5.2 Insufficient Research

5.2.1 Lack of Comparative Research

Most existing research in China is independent research projects, lacking comparison and analysis between different studies. This makes it difficult to comprehensively evaluate the effectiveness and applicability of online teaching evaluation based on Kirkpatrick model.

5.2.2 The Evaluation Indicators Being Not Precise Enough

Although researchers have adopted various evaluation methods, there is still a certain degree of subjectivity and ambiguity in the formulation of specific evaluation indicators. This may lead to inaccurate and inconsistent evaluation results.

5.3 Lack of Long-term Follow-up Research

Most existing research is short-term evaluations, lacking long-term tracking and research on students over a period of time. This makes it difficult to fully understand the long-term effects of online teaching and the continuous development of students.

5.4 Lack of Interdisciplinary and Cross-cultural Research

Existing research has mostly focused on specific disciplines or fields, lacking interdisciplinary and cross-cultural research. This limits the promotion and application of online teaching effectiveness evaluation based on Kirkpatrick model in different contexts and application areas.

5.5 Future Research Directions and Suggestions

In view of the above problems, future research needs to further explore and practice innovation to promote the further development and application of online teaching effectiveness evaluation based on Kirkpatrick model.

5.5.1 Strengthening Comparative Research

Future research can conduct comparative experiments or cohort studies to compare the advantages and disadvantages of different online teaching effectiveness evaluation methods to determine which method is more effective and applicable. At the same time, a database of online teaching effectiveness evaluation can be established to collect and analyze data from different research projects for comparison and analysis.

5.5.2 Refined Evaluation Indicators

In the development of evaluation indicators, future research can focus more on objectivity and refinement. For example, quantitative and standardized evaluation tools, such as questionnaire surveys and exam scores, can be used to measure the response and learning outcomes of participants. At the same time, a variety of evaluation methods can be combined, such as formative and summative evaluations, quantitative and qualitative evaluations,

to improve the accuracy and consistency of evaluation results.

5.5.3 Conducting Long-term Follow-up Research

Future research can focus on the long-term development of students and conduct long-term follow-up research. By regularly collecting and analyzing data, it is possible to understand the learning outcomes and behavioral changes of students over different time periods, in order to better evaluate the long-term effects of online teaching.

5.5.4 Promoting Interdisciplinary and Cross-cultural Research

Future research can focus on interdisciplinary and cross-cultural fields and conduct relevant research. For example, it can draw on theories and methods from other disciplines and apply them to online teaching effectiveness evaluation to improve the pertinence and effectiveness of evaluation. At the same time, international cooperation can be carried out to compare online teaching effectiveness evaluations under different cultural backgrounds, so as to better promote and apply the online teaching effectiveness evaluation method based on Kirkpatrick model.

5.5.5 Strengthening the Orientation of Practical Application

Future research can focus more on the orientation of practical application, and pay attention to how to apply online teaching effectiveness evaluation methods to practical teaching. For example, practical case studies can be conducted to summarize successful online teaching experiences and practical models, providing reference for online teaching in other fields and disciplines.

5.5.6 Focusing on Technology Application and Innovation

With the development and innovation of technology, future research can focus on the application of new technologies in online teaching effectiveness evaluation. For example, artificial intelligence, big data and other technological means can be used to develop intelligent assessment tools and methods to improve the efficiency and accuracy of evaluation. At the same time, new

online teaching models and methods can be explored, such as reverse classroom, blended teaching, etc., to improve the quality and effectiveness of online teaching.

5.5.7 Training Professional Talents

In order to promote the development and application of online teaching effectiveness evaluation based on Kirkpatrick model, it is necessary to cultivate a group of professionals with relevant theoretical knowledge and practical experience. Future research can focus on talent cultivation issues, and improve the professional literacy and abilities of researchers and teachers through the establishment of relevant courses, training, and seminars.

6. CONCLUSION

Through a literature review of online teaching effectiveness evaluation based on Kirkpatrick model, this study found that Kirkpatrick model has become an important tool for evaluating training programs and online learning effectiveness. It provides an important theoretical framework and practical guidance for online teaching effectiveness evaluation. However, there is still a need to further improve evaluation tools and methods, combine multiple evaluation methods to enhance the comprehensiveness and accuracy of evaluation, focus on cross-disciplinary applications to expand its influence, and improve the quality of evaluators and strengthen the quality assurance and management of online teaching to enhance evaluation effectiveness. Future research should focus on addressing these key issues to promote the sustainable development and improvement of online teaching. By continuously exploring effective ways and methods of evaluating online teaching effectiveness, we can better promote innovation and development of education, and provide students with a more quality, convenient, and efficient learning experience.

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