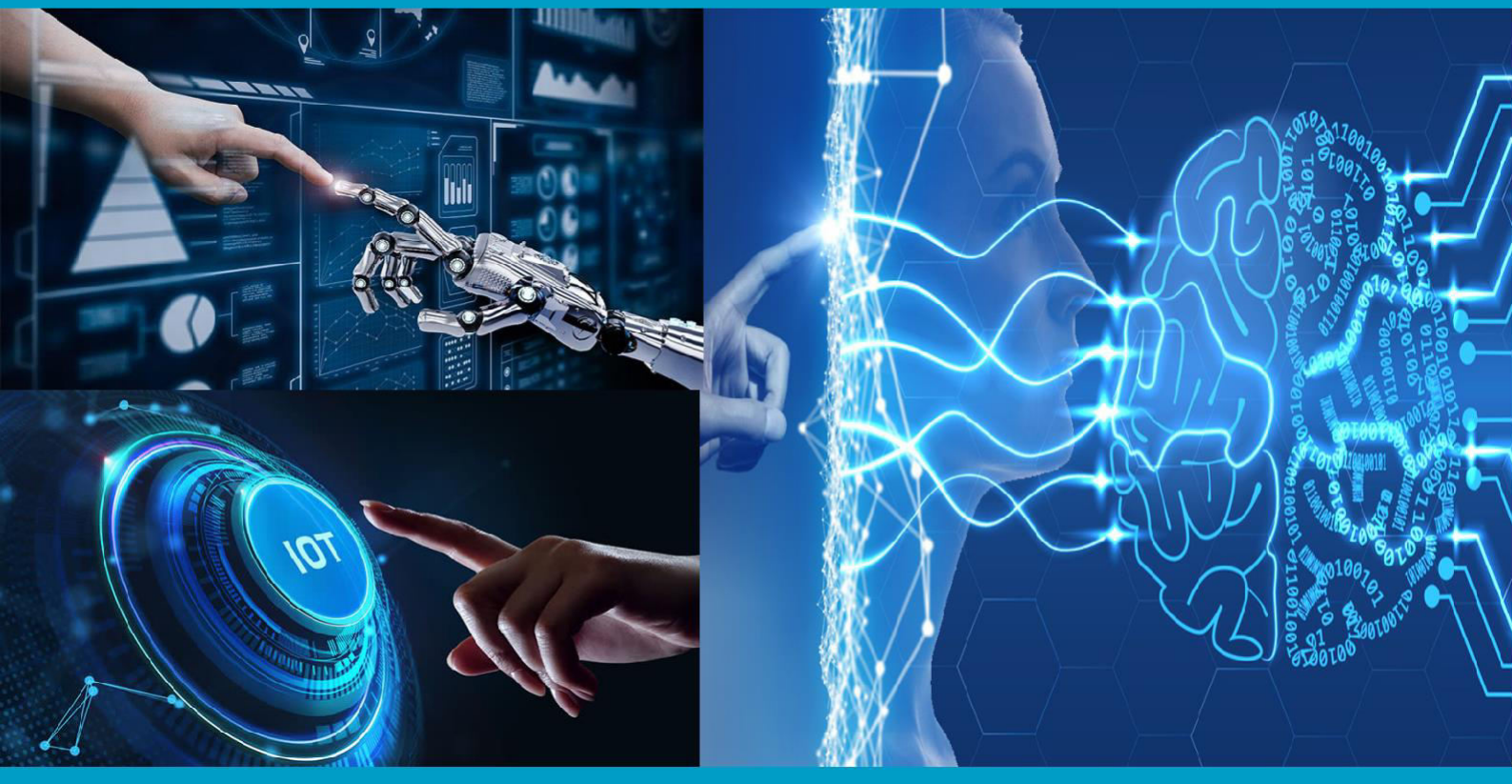
IJMRSETM

e-ISSN: 2395 - 7639



INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH

IN SCIENCE, ENGINEERING, TECHNOLOGY AND MANAGEMENT

Volume 12, Issue 2, February 2025

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 8.214

International Journal of Multidisciplinary Research in Science, Engineering, Technology & Management (IJMRSETM)

| ISSN: 2395-7639 | www.ijmrsetm.com | Impact Factor: 8.214 | A Monthly Double-Blind Peer Reviewed Journal |

| Volume 12, Issue 2, February 2025 |

Curriculum Knowledge Graph Construction and Teaching Design of Undergraduate Education in Universities

Jing Lei [1*], Jia-Qing Song [2], Yan Chen [1], Wei Zhang [1], Yan Liang [1]

School of Mathematics and Statistics, Taishan University, Tai'an, China[1]

Experimental Teaching Management Center, Taishan University, Tai'an, China[2]

ABSTRACT: This paper introduces the background of the construction of course knowledge graph in undergraduate colleges and universities, describes the important role of knowledge graph technology in course teaching and learning, and expounds the construction process of course knowledge graph and knowledge graph recommendation system. Through the research on course teaching, it is found that the application of knowledge graph system can stimulate students' initiative in learning, make students master more comprehensive course knowledge, and effectively improve the teaching quality of higher education.

KEYWORDS: Undergraduate education; Course; Knowledge graph; Recommender system.

I. INTRODUCTION

Google proposed the Knowledge Graph in 2012 and is using the technology to enhance its search services. Knowledge graphs have brought vitality to Internet semantic search, and at the same time, they have also demonstrated powerful capabilities in the question answering system. At present, the widely used technologies such as knowledge base search, recommendation and Q&A are all based on knowledge graph related knowledge.

In the context of today's rapid development of information technology, traditional curriculum teaching strategies are facing challenges. On the one hand, a single linear teaching method can no longer effectively meet the diverse learning needs of students, especially in achieving personalized learning. On the other hand, traditional teaching strategies lack the strength to stimulate students' enthusiasm for learning and optimize the learning effect.

Knowledge graph has been quite popular in daily life, such as Baidu search based on Baidu knowledge graph, Sogou search based on Zhicube database, etc., which are closely related to people's lives. In the field of scientific research, knowledge graphs also play an important role, such as graph construction and knowledge reconstruction with large model sets. However, the integration with education and knowledge graph is still a new research field. The educational knowledge graph is based on "knowledge learning" as the core, sorts out the hierarchical structure and relationship of majors and courses, constructs the relationship between all knowledge points, links relevant digital teaching content, and finally visualizes the complete knowledge structure with a visual graph, and intuitively presents the knowledge structure and distribution of the entire course in the form of "knowledge map" from the perspective of the course as a whole. By applying the knowledge graph related knowledge to the field of classroom teaching, it can be found that after combing the knowledge points based on the knowledge graph, a customized learning path for the individual needs of students is formed, and then combined with online and offline teaching and multi-dimensional experimental teaching, a personalized teaching plan can be realized, which can improve the teaching quality of the course and lay a solid foundation for the learning of students' subsequent courses. Constructing a curriculum knowledge graph can help reconstruct curriculum teaching resources and promote personalized learning from the perspective of students. From the perspective of teachers, it is helpful for teachers to innovate and make breakthroughs in scientific research, and accurately locate the development of cutting-edge knowledge. From the perspective of managers, it is helpful for managers to improve the talent training program and plan the training of students from the perspective of knowledge.

This paper discusses the construction of knowledge graph technology in undergraduate education in colleges and universities, the strategies of related teaching design, and the application and effectiveness of knowledge graph technology in teaching practice. It is expected that the knowledge graph technology can provide a useful reference for the education field in adopting innovative teaching strategies, especially in improving the quality of curriculum teaching.

| ISSN: 2395-7639 | www.ijmrsetm.com | Impact Factor: 8.214 | A Monthly Double-Blind Peer Reviewed Journal |

| Volume 12, Issue 2, February 2025 |

II. APPLICATION OF KNOWLEDGE GRAPH IN EDUCATION

Knowledge graphs have been widely used in the field of education, and their research hotspots are mainly focused on professional development and professional curriculum teaching. The existing knowledge graph is more applied between different disciplines, and the analysis and application of a single curriculum is not well studied. The combination of course knowledge graph and question and answer system can timely understand students' mastery of knowledge, and can effectively improve students' enthusiasm for learning in course teaching. The construction of knowledge graph enables students to quickly and easily obtain knowledge from knowledge graphs. The application of course knowledge graph can effectively save time and achieve accurate problem positioning. Knowledge graph has a good way to realize relationships, which can enable students to fully understand domain knowledge and analyze problems through relationships, and find solutions to problems. Practice has proved that the use of knowledge graph technology can help students understand the course knowledge and professional knowledge more intuitively, so as to have a more comprehensive understanding of the knowledge content they need to master, and facilitate the construction of a complete knowledge architecture. Therefore, in the course teaching and practice, teachers can guide students to obtain knowledge from the knowledge graph through real-time interaction, so as to optimize the knowledge architecture, and at the same time carry out targeted teaching, promote students' in-depth learning, and improve teaching efficiency.

III. COURSE KNOWLEDGE GRAPH CONSTRUCTION

(1) Form a summary of the course knowledge graph
Collect teaching-related materials such as talent training programs, course syllabuses, online courses for reference, and teaching materials, and vertically match the high-quality resource information related to this course on the whole network through the search engine. Then, combined with the teaching scenarios and professional directions, the goal of course knowledge graph construction was proposed. Based on the results of search analysis, summarize and sort out the basic information, ideas and objectives of the construction of the course knowledge graph, such as course background, course introduction, course objectives, course characteristics, knowledge logic, teaching plan, etc., and form the course summary of the course knowledge graph.

(2) Design the curriculum framework
According to the construction ideas of the course, determine the teaching logic of the course, such as knowledge-oriented, problem-oriented, skill-oriented, and comprehensive-oriented. On this basis, the overall framework of the course theme is designed according to the teaching objectives of the stage, the boundaries of the knowledge fields and the relationship between the fields, the content scope of the topic is confirmed, the topics are listed, the content scope of the topic is described, the sub-topics and the content scope of the topic are described, and they are presented.

(3) Extract the course map
With knowledge points and skill points as the course content nodes, the course map in the form of a tree-like mind map is constructed, and the content types are divided, such as overview, case, experiment, summary, exercise, problem (citation), course focus, difficulty, etc., and these content types are added to the knowledge points, so that the course map can present the complete explanation logic of the course, depict the knowledge structure and the hierarchical relationship of knowledge points in the whole system.

(4) Integrate knowledge points
View and analyze the existing resources of the course, including: videos, animations, imitations, textbooks, courseware, materials, etc., disassemble the structure, convert and recognize the text of text materials, mark, associate and mount the start and end time corresponding to knowledge points such as video animation, the pagination corresponding to courseware and knowledge points, and the paragraphs corresponding to textbooks and knowledge points, so as to build multimodal teaching resources that accurately correspond to knowledge points.

(5) Integrate the curriculum knowledge graph
Confirm the scope of the course that needs to be covered in the professional training objectives, sort out the competency objectives of the course, and construct the competency map of the course according to the competency objectives of the course. Sort out the real common problems of course knowledge in theoretical research and application, and the classic work tasks in actual production and life scenarios, sort out the comprehensive application problems, practical operation problems, and combination of theory and practice problems of the course, and set up the connection based on the relationship between the problems, and then associate the knowledge points involved in solving the problem with the corresponding problems, and construct the problem map of the course, so as to finally establish the connection of ability, problem, knowledge and resources, so that the knowledge spectrum of the course map is completely connected. It also

| ISSN: 2395-7639 | www.ijmrsetm.com | Impact Factor: 8.214 | A Monthly Double-Blind Peer Reviewed Journal |

| Volume 12, Issue 2, February 2025 |

has the guiding significance of solving specific knowledge application problems, and the cross-dimensional relationship between each dimension is also clearly indicated.

(6) Improve the curriculum knowledge system

The graphical setting of the knowledge graph on the teacher's side will fully show the characteristics of the major, the curriculum and the learning path with "teaching" as the main line, while on the student side, when the network relationship based on the graph makes personalized recommendations to students, the "learning" will be the main line, and the student's learning path will also be recorded, so that the subsequent comparison can be based on the learning path of the two main lines, providing a basis for the optimization of the graph for the purpose of improving the teaching application effect. Based on the search and matching of the whole network of major search engines, supplemented by manual collection, review and filtering, the knowledge points are updated and supplemented by external expansion, as well as the practical application and case data of the knowledge points, and the portrait of a single knowledge point is continuously improved and iterated.

IV. CONSTRUCTION OF KNOWLEDGE GRAPH RECOMMENDATION SYSTEM

(1) Knowledge graph and student model construction

The first task of building a knowledge graph-based recommendation system is to build a knowledge graph and a student model. The knowledge graph is established based on the content of the syllabus and textbooks, that is, a multi-level and multi-dimensional knowledge network is constructed with the teaching knowledge points as the nodes and the relationship between the knowledge points as the edge. In the knowledge graph, the relationships between nodes include different types from basic to advanced, from pre-to posterior, analogy and contrast, etc., and the weights of various relationships are determined according to teaching practices and needs. For specific courses, the knowledge graph is composed of the interconnection of various knowledge points.

Student model construction provides an abstract representation of students' knowledge mastery. First, the student model reveals students' level of knowledge mastery based on data on students' performance in the course, such as assignment grades, quiz feedback, and online learning behavior. Then, machine learning algorithms are used for these data analyses to generate a student knowledge mastery graph that matches the course knowledge graph. In practice, in order to be able to capture students' learning in real time, the student model should be updated regularly. Knowledge graphs and student models can provide a solid foundation for a knowledge graph-based recommendation system to achieve accurate and personalized recommendations.

(2) Design of knowledge graph recommendation system

On the basis of knowledge graph and student model, the design and construction of knowledge graph recommendation system has become the top priority. The knowledge graph recommendation system mainly involves two key contents: the selection and optimization of the recommendation algorithm and the specific implementation of system functions. The first step in achieving accurate and personalized recommendations is to choose the right recommendation algorithm. For example, a graph-based algorithm can generate a list of recommendations based on the relationship between knowledge points and students' mastery of each knowledge point. However, it is not enough to select an algorithm, it is necessary to further optimize the algorithm according to the specific teaching scenario. In practice, it is necessary to comprehensively consider the student's learning journey, learning outcomes, learning objectives and other elements in order to dynamically adjust the recommended content and achieve personalized recommendation.

The realization of the function of the knowledge graph recommendation system is mainly reflected in the aspects of teaching content recommendation and personalized guidance, learning path planning and teaching schedule, teaching resource integration and recommendation, diversified teaching interaction and practical application, and students' independent learning and self-evaluation. For example, the knowledge graph recommendation system can provide targeted teaching content and learning paths based on students' learning records and knowledge mastery status. In terms of the integration and recommendation of teaching resources, the knowledge graph recommendation system can be associated with various teaching resources, such as handouts, exercises, reference books, etc., to provide students with a full range of learning materials. In terms of diversified teaching interaction and practical application, the knowledge graph recommendation system can set learning tasks based on the knowledge graph to encourage students to actively participate in learning and practice. The knowledge graph recommendation system supports students' self-directed learning and self-assessment functions, allowing students to plan learning tasks and evaluate learning outcomes by themselves. This type of design aims to maximize the advantages of knowledge graphs and student models and improve the quality of teaching.

| ISSN: 2395-7639 | www.ijmrsetm.com | Impact Factor: 8.214 | A Monthly Double-Blind Peer Reviewed Journal |

| Volume 12, Issue 2, February 2025 |

V. DESIGN OF TEACHING METHODS

The design of teaching methods based on knowledge graphs can not only promote students' self-directed learning, but also provide effective tools for students' self-evaluation, so as to further improve students' self-directed learning and reflection ability.

(1) Integration and recommendation of teaching resources

In the design of teaching methods based on knowledge graph, the integration and recommendation of teaching resources is the core component, which aims to integrate teaching resources and provide students with information that meets their needs through the knowledge graph recommendation system, so as to ensure that students obtain the most suitable teaching materials, so as to improve learning efficiency.

In the integration of teaching resources, it is necessary to ensure that all teaching resources are associated with the knowledge points in the knowledge graph. Teaching resources include textbooks, reference books, online courses, lab guides, question banks, etc. To ensure the accuracy of recommendations, each teaching resource should be accompanied by relevant knowledge tags. In this way, the knowledge graph recommendation system can quickly find suitable teaching materials according to the learning status and needs of students.

In terms of teaching resource recommendation, the knowledge graph recommendation system mainly provides appropriate teaching resources based on students' learning behaviors and learning needs. If students encounter difficulties in learning a certain knowledge point, the knowledge graph recommendation system may recommend auxiliary materials or exercises related to a certain knowledge point to deepen students' understanding of a certain knowledge point. Conversely, if a student excels in learning a certain knowledge point, the knowledge graph recommendation system may recommend more advanced or more extended materials and courses to help them further deepen their understanding. This way of integrating and recommending teaching resources improves the utilization efficiency of teaching resources, helps to improve students' learning efficiency, meets their personalized learning needs, and then improves the overall quality of teaching.

(2) Teaching content recommendation and personalized guidance

In the design of teaching methods based on knowledge graph, teaching content recommendation and personalized guidance are the key links, mainly combining the technology of the knowledge graph recommendation system, the structure and content of the knowledge graph, and recommending teaching resources that are consistent with the learning needs and learning ability of students. The knowledge graph recommendation system captures and uses the students' learning behavior data, combined with the knowledge nodes and knowledge associations in the knowledge graph, and recommends the teaching content. For example, analyze the learning time of students on specific knowledge points, the number of exercises completed, and the accuracy rate of exercises, judge the students' mastery level of knowledge points, and recommend corresponding learning resources or related knowledge points accordingly. In this process, the knowledge graph recommendation system may adopt technologies such as collaborative filtering, content-based recommendation, and deep learning to ensure the accuracy of recommendations. The knowledge graph recommendation system provides more detailed services for personalized guidance. For example, by analyzing students' learning behaviors, identifying learning difficulties and points of interest, and providing students with targeted teaching opinions and resources.

In addition, learning paths can be customized for students to learn knowledge points according to their learning speed and level of understanding. This kind of teaching content recommendation and personalized guidance can not only meet the actual needs of students, but also stimulate students' interest in learning, improve students' learning efficiency, and optimize teaching results.

(3) Diversified teaching interaction and practical application

In the design of teaching methods based on knowledge graphs, diversified teaching interaction and practical application can further enhance the teaching effect. In this teaching model, teacher-student and student-to-student interaction is no longer limited to the traditional classroom lecture and question-and-answer mode. The knowledge graph recommendation system can be used to achieve more personalized and diversified interactions. For example, teachers can design interactive tasks closely related to knowledge points according to the structure of the knowledge graph, such as question answering, project practice, group discussion, etc. This not only helps students deepen their understanding of the knowledge points, but also encourages them to apply what they have learned in practical situations. At the same time, students can also use the knowledge graph to find relevant teaching resources and answers when completing interactive tasks, so as to truly achieve independent learning.

| ISSN: 2395-7639 | www.ijmrsetm.com | Impact Factor: 8.214 | A Monthly Double-Blind Peer Reviewed Journal |

| Volume 12, Issue 2, February 2025 |

In addition, the knowledge graph recommendation system can also recommend practical projects that match students' abilities and interests according to their learning performance and learning needs, so as to further stimulate their enthusiasm for learning and cultivate their practical ability and innovative thinking. Diversified teaching interaction and practical application play a key role in the teaching design based on knowledge graph, which can not only fully mobilize students' enthusiasm for learning, but also enhance students' practical ability, so as to achieve the purpose of optimizing the teaching effect.

(4) Learning path planning and teaching schedule

Learning path design and teaching schedule arrangement are the core parts of the teaching method based on knowledge graph, and the core goal is to use the structure of knowledge graph and the technology of knowledge graph recommendation system to plan personalized learning paths and teaching progress for students. Students' learning paths are influenced by a variety of factors, such as learning goals, abilities, interests, and acquired knowledge. Firstly, the knowledge graph recommendation system analyzes students' learning behaviors to understand students' learning characteristics and needs. Then, according to the knowledge points and their relationships in the knowledge graph, the learning path from the mastered knowledge to the target knowledge is recommended. This path not only shows the logical connection between the knowledge points, but also takes into account the learning characteristics of the students and is closer to the learning requirements of the students. In terms of teaching schedule, the knowledge graph recommendation system can dynamically adjust the subsequent learning plan according to the actual performance of students in the learning path. If the learning time of a certain knowledge point exceeds the expectation, the subsequent learning plan may be adjusted and postponed. Conversely, if a student's learning progress is faster than expected, the next study plan may be brought forward. This approach ensures that students learn at the right pace and thus absorb knowledge more efficiently.

(5) Students' self-directed learning and self-assessment

The design of teaching methods based on knowledge graph provides strong support for students' self-directed learning and self-evaluation. In this teaching mode, students can personalize their learning according to the display of the knowledge graph, their own learning pace and interests, and conduct self-evaluation through the feedback of the knowledge graph recommendation system.

In the process of self-directed learning, a clear and structured knowledge map can show students the system and internal connections of knowledge, and help them choose the appropriate learning path according to their learning needs. At the same time, the knowledge graph recommendation system will provide personalized teaching resources and learning tasks according to students' learning performance and learning needs, so as to further stimulate students' interest in learning and improve students' learning efficiency.

In the self-assessment session, students can understand their mastery of knowledge points by completing the exercises and tasks recommended by the knowledge graph recommendation system. The Knowledge Graph Recommendation System will provide immediate and detailed feedback based on students' performance and learning progress, so that students can have a clearer understanding of their learning status and adjust their learning strategies accordingly, so as to optimize the learning process in a more targeted manner.

VI. APPLICATION AND EFFECTIVENESS OF TEACHING

(1) Online teaching

Guidance and supervision of self-directed learning: With the help of the visual display and navigation function of the knowledge graph, students are guided to learn independently, and the learning management system is used to supervise and manage the learning process. Through the data analysis of the learning platform, students' learning problems can be discovered in time and targeted guidance can be provided. If students are found to be hindered in learning knowledge points, relevant animation demonstrations, detailed explanation documents and analysis of similar mistakes will be pushed to help students overcome difficulties and significantly enhance students' independent learning ability and learning effect.

Optimization of online test and feedback: Through the design of a variety of online test question types, students' knowledge mastery and application ability are comprehensively tested, and the test results are analyzed in a timely manner. Taking the feedback of case analysis questions as an example, it not only presents the correct answers, but also deeply analyzes the knowledge points involved in the case and the application scenarios. Through detailed problem-solving ideas and knowledge point explanations, students can quickly locate and make up for learning loopholes, have a more thorough understanding of knowledge, apply knowledge more flexibly, and significantly improve the overall learning effect.

| ISSN: 2395-7639 | www.ijmrsetm.com | Impact Factor: 8.214 | A Monthly Double-Blind Peer Reviewed Journal |

| Volume 12, Issue 2, February 2025 |

In-depth integration and personalized push of course resources: After the course knowledge graph is deeply integrated with teaching videos, courseware, practice questions, etc. into an organic course resource system, the system implements personalized push according to students' learning progress, hobbies, knowledge mastery and other information. The results of this initiative have been remarkable. Students can accurately obtain learning resources that meet their own needs, and their learning efficiency is greatly improved. For example, for students with weak foundations, the system pushes basic concept reinforcement resources; For those who have spare time to learn, they will push extended knowledge materials, so that students at different levels can better absorb knowledge on their own basis, and the learning effect is significantly optimized.

(2) Offline teaching

Interactive and inquiry-based teaching in classroom teaching: Teachers have achieved remarkable results in using the curriculum knowledge graph to carry out interactive and inquiry-based teaching. By designing open-ended questions based on knowledge graph knowledge points and organizing group discussions and sharing, students' thinking ability and innovation ability are effectively stimulated. During the discussion, students can dig out various factors from the knowledge graph, carry out lively discussions and put forward innovative insights, which greatly improves students' in-depth understanding and comprehensive application of knowledge, enlivens the classroom atmosphere, and promotes students' positive thinking and teamwork.

Design and guidance of experimental teaching: Teachers design scientific and reasonable experimental teaching plans based on the experimental content of knowledge graphs and strengthen guidance, and obtain good results. In the experiment, the teacher guided the students to understand the principles and methods of the experiment with the help of the knowledge graph, which significantly improved the success rate of the experiment. Students can better understand the significance of each link of the experiment, standardize the operation of experimental equipment, accurately observe experimental phenomena and analyze experimental results in depth, effectively cultivate their practical ability and scientific literacy, and lay a solid foundation for relevant scientific research work in the future.

(3) The development and effectiveness of teaching evaluation

Diversification and process of formative assessment: Diversified formative assessment methods are used to comprehensively evaluate students' learning process. Through multi-dimensional evaluations such as classroom performance, homework completion, online learning participation, and group discussion performance, students can find learning problems in time and give feedback and guidance, and then flexibly adjust teaching strategies. For students with low participation in online learning and high homework error rate, teachers communicate with them in a timely manner and provide personalized learning suggestions and resources to help them correct their learning attitudes, improve their learning methods, significantly improve their teaching effectiveness, make the teaching process more suitable for students' needs, and promote students' all-round development.

Scientific and comprehensive summative evaluation: The scientific and reasonable summative evaluation at the end of the course has achieved remarkable results. In addition to the traditional final exam, combined with classroom performance, weekday homework, chapter tests, experimental reports and other comprehensive examination methods, students' knowledge mastery, application and innovation ability are comprehensively tested. At the same time, feedback was collected through questionnaires and student interviews to provide a strong basis for teaching improvement. According to the evaluation results, the students' abilities in many aspects have been significantly improved, and the feedback provides a direction for the optimization of teaching content and teaching methods, and promotes the continuous improvement of teaching quality.

(4) Improvement of overall teaching effect

Achievement of improvement of students' learning effect: (1) Learning interest and enthusiasm are greatly enhanced. The visual presentation of the knowledge graph makes the learning process full of interest, stimulates students' curiosity and desire for knowledge, enables students to actively explore the connection between the nodes of the knowledge graph, significantly improves the participation in classroom discussions and group activities, has a strong learning atmosphere, and changes the learning attitude from passive to active, laying a good psychological foundation for in-depth learning. (2) Effective cultivation of self-directed learning ability. Students can use the knowledge graph and online teaching platform to select knowledge points for in-depth learning according to their own learning progress and needs, and obtain rich resources through the knowledge graph link. Online tests and practice feedback help students keep abreast of their learning status, adjust their learning strategies, improve their learning efficiency, and effectively exercise their self-directed learning ability, laying a solid foundation for career development. (3) The degree of knowledge mastery has been significantly improved. According to the teacher's analysis of students' final examination results, after adopting the blended teaching mode combined with the knowledge graph, the average score of students has been greatly improved, and the scoring rate of each knowledge point has increased significantly.

| ISSN: 2395-7639 | www.ijmrsetm.com | Impact Factor: 8.214 | A Monthly Double-Blind Peer Reviewed Journal |

| Volume 12, Issue 2, February 2025 |

Achievements of improving teachers' teaching effectiveness: (1) Teaching innovation is effectively stimulated. The knowledge graph opens up a broad space for teachers' teaching innovation. Teachers combine knowledge graph design group projects, case analysis, knowledge competitions and other rich teaching activities to stimulate students' interest and creativity in learning. For example, organize students to use the knowledge graph to organize and summarize knowledge, make mind maps or learning reports, exercise students' comprehensive analysis and expression skills, and at the same time enhance the cooperative learning of teachers and students through the interactive exchange of knowledge graphs, and promote the innovation of teaching methods and the reform of teaching models. (2) The quality of teaching has been significantly improved. Students' feedback and test results show that the application of knowledge graph makes the teaching content systematic and comprehensive, and the explanation of important and difficult points is clearer and thorough. The combination of online and offline teaching methods is flexible and diverse to meet the personalized learning needs of students. Teachers adjust their teaching strategies in a timely manner according to the learning situation of students' online platforms, provide personalized guidance, and significantly improve the quality of teaching, providing a strong guarantee for cultivating high-quality talents. (3) The teaching efficiency has been significantly improved. Teachers can organize teaching content more efficiently with the help of knowledge graphs, clearly display the association of knowledge points, make the teaching process smooth, and save time for explanation. According to the structure of the knowledge graph, the teaching links are designed in a targeted manner to help students understand the uniqueness, the teaching rhythm is more accurate, and the teaching efficiency is significantly improved.

VII. CONCLUSION

As a visual and structured way of presenting knowledge, knowledge graph can clearly show the connection between various knowledge points. The knowledge graph system combines advanced data analysis technology and recommendation algorithms to provide customized teaching content according to students' learning status and needs, which can further improve the quality of teaching. At the same time, the design of the knowledge graph system not only considers the recommendation of knowledge points, but also deeply considers the detailed planning and design of teaching progress, teaching resources, and students' learning paths. The application of knowledge graph related content to teaching can explore new teaching methods, provide useful references for the innovation and optimization of teaching methods, and achieve the improvement of teaching quality and teaching effect.

REFERENCES

[1] Zou Wen. Research on the Design of Blended Teaching in Higher Education Courses Empowered by Knowledge Graph: Taking the Course of Foreign Trade Commodity Studies as an Example. Modern Business and Industry, 2025, (05):253-255.

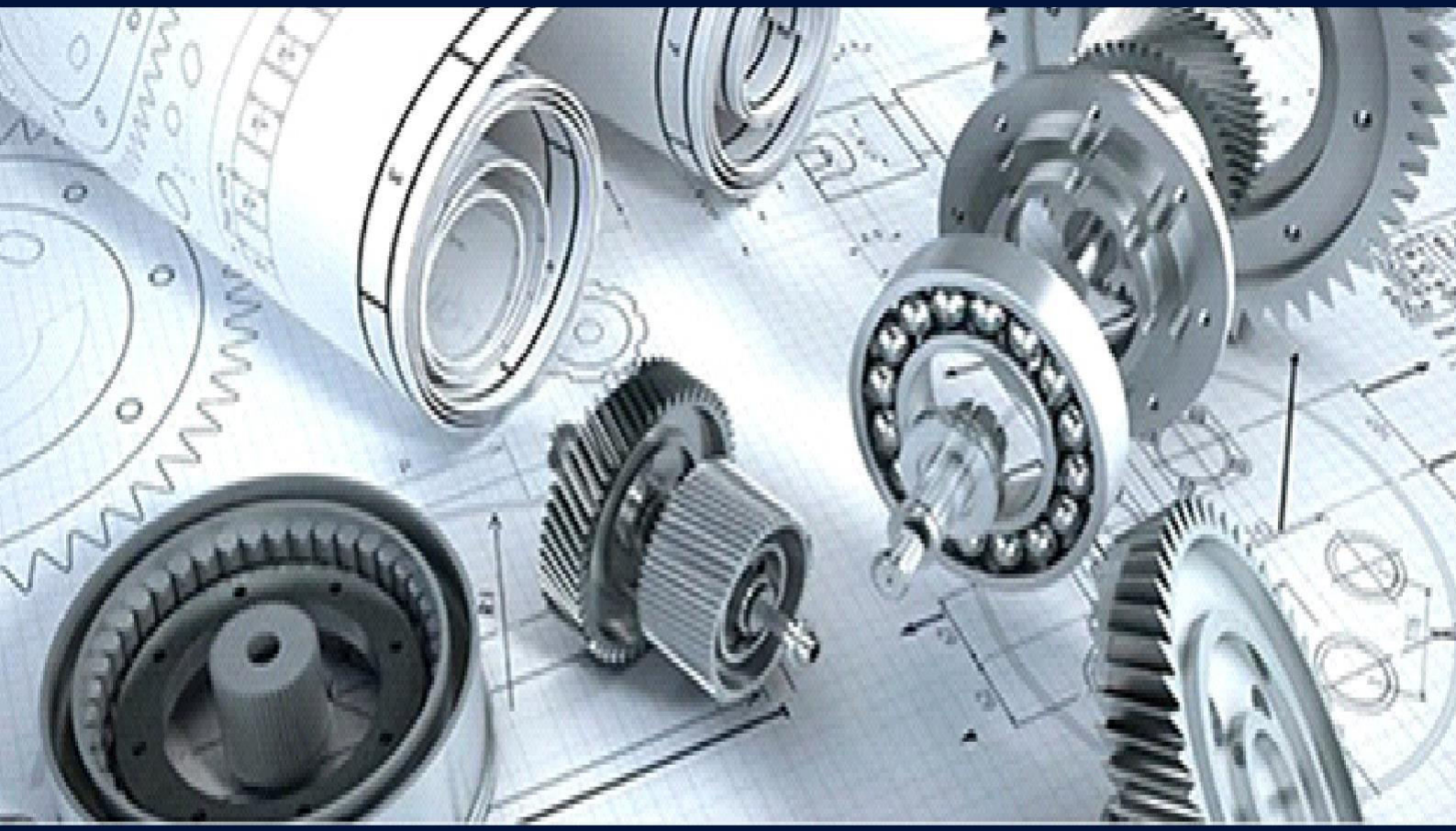
[2] Wang Yingdan. Construction of the Curriculum System for Basic Accounting from the Perspective of AI&Knowledge Graph Empowerment. Accounting for Township Enterprises in China, 2024, (16):181-183.

[3] Luo Lixia. Construction and Application of Knowledge Graph Driven "Data Mining" Online Course. Information Systems Engineering, 2024, (12):119-122.

[4] Xie Youru, Lu Yi, Peng Zhiyang, etc. Exploration of Knowledge Graph Empowering the Integration of "Teaching Learning Evaluation" in University Curriculum. China Electronic Education, 2024, (12):1-7.

[5] Zhou Bo. Research on the Construction of Curriculum Knowledge Graph under the Background of New Liberal Arts Construction [J]. Journal of Xi'an Aeronautical University, 2024, 42 (06): 60-68.

[6] Zhan Wen, Hu Zhe, Jiang Yuan, etc. Construction of Formative Curriculum Evaluation System Based on Knowledge Graph: Taking Information Theory and Coding Curriculum as an Example. Education Observation, 2024, 13 (31): 6-10.



INTERNATIONAL STANDARD SERIAL NUMBER INDIA

INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH

IN SCIENCE, ENGINEERING, TECHNOLOGY AND MANAGEMENT

+91 99405 72462 +91 63819 07438 ijmrsetm@gmail.com