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RESEARCH ARTICLE

Sustainable Development of Internationalized Training of Teaching and Research Competence for Chinese university educators Under the Concept of OBE

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ARTICLE INFO	**ABSTRACT**
  *Corresponding Author: sadiq.ali2209m@comed. uobaghdad.edu.iq	This paper examines the role of Outcome-Based Education (OBE) in fostering the internationalization of teaching and research competence among Chinese university educators, which is crucial for enhancing global competitiveness in higher education. With its focus on student learning outcomes and the reverse design principle, OBE offers a strategic approach to aligning training with the actual needs of educators. The study reviews the literature on OBE, its application in international training, and the concept of sustainable development in higher education. This study used qualitative methods to obtain answers to the research questions, and conducted semi-structured interviews with 27 teachers as the main data providers. It identifies key challenges faced by educators, such as insufficient support systems, a disconnect between training and practical needs, and an imbalance between teaching and research priorities. To overcome these, the paper suggests strategies, including strengthening inter-university collaboration, developing an international teaching model, and building a research-integrated teaching community. The integration of OBE into training programs is proposed to achieve sustainable development in higher education, emphasizing continuous improvement and data-driven refinement of training practices.

INTRODUCTION

In the era of globalization, the internationalization of education has become a strategic imperative for higher education institutions worldwide, particularly for those in China seeking to enhance their global competitiveness and attract international students and scholars. As the primary agents of knowledge transmission and innovation, university educators play a pivotal role in this endeavour. Their capacity for international teaching and research not only shapes the quality of education offered but also determines the institution's ability to contribute to global academic discourse and collaborations. Consequently, fostering the internationalization of teaching and research capabilities among Chinese university educators has emerged as a critical issue requiring urgent attention.

In recent years, the Outcome-Based Education (OBE) concept has gained prominence in the field of education. OBE emphasizes the student learning outcomes as the guiding principle, reversing the design of the educational process to ensure the achievement of educational goals. Introducing the OBE concept into the international training of university educators can not only clarify training objectives, improve training effectiveness, but also provide a solid foundation for the sustainable

development of training programs. Guided by the OBE concept, the content of international training can be closely aligned with the actual needs of educators, the training methods can be made more scientific and effective, and the training evaluation can be more objective and fairer, thereby driving the international training to a higher level of development.

The current study aims to contribute to this discourse by examining the potential of the OBE framework in guiding the sustainable development of international training programs for Chinese university educators. Drawing on relevant literature and empirical evidence, this paper will first provide an overview of the OBE framework and its relevance to international training. Subsequently, it will analyse the current status of international training programs for Chinese university educators, identifying key challenges and opportunities. Based on this analysis, a set of OBE-based strategies for sustainable development of international training will be proposed. The study concludes by discussing the implications of these strategies for policy-makers, educators, and other stakeholders in the field of higher education internationalization.

LITERATURE REVIEW

Over the past years, domestic scholars have carried out extensive research on the OBE concept and the internationalization of higher education. Concurrently, international scholars have also conducted comprehensive studies on the same topics during this period.

2.1. OBE concept

Outcome-Based Education (OBE), also known as Outcomes-Based Learning, is a pedagogical approach that focuses on ensuring students achieve specific, measurable, and learning-centred outcomes by the end of a course, program, or educational experience (Spady, 1994). At the core of OBE lies the principle of reverse design, where instructional objectives, methods, and assessments are aligned to and derived from desired learning outcomes. This approach shifts the emphasis from traditional content-driven teaching to a more student-centred and outcomes-oriented model. Su & Li (2018) Explored the construction of general education curriculum teaching and assessment system based on the OBE concept, using Tsinghua University as a case study.

2.2. Application of OBE in Teaching and Research Training

The OBE framework has gained traction in recent years to enhance the quality and effectiveness of teaching and research training programs, particularly in the context of internationalization. Several studies have demonstrated the potential of OBE in fostering the development of educators' international competencies.

For instance, Zheng et al. (2023) applied OBE principles to the design of an international teaching training program in Ningbo university. Their program emphasized the development of intercultural competence, global perspective, and teaching strategies tailored to diverse student populations. By defining clear learning outcomes related to these areas, the program was able to align instructional activities, such as case studies, simulations, and international field trips, with the intended outcomes. Furthermore, ongoing assessment and feedback mechanisms were implemented to monitor student progress and adjust the program accordingly.

In the realm of research training, OBE has been shown to be equally effective. Li et al. (2020) argued that the adoption of OBE in research training can help researchers develop critical thinking, problem-solving, and communication skills essential for conducting international research. By defining research competencies as learning outcomes, educators can design research projects, workshops, and mentorship programs that actively foster these skills. Moreover, the use of peer reviews, conferences, and publications as assessment tools ensures that researchers are held accountable for demonstrating their competence in international research.

Another significant aspect of OBE in teaching and research training is its emphasis on continuous improvement. By investigating the integration of outcome-based education into teaching practices at the university level and to assess the differences between the perspectives of educators regarding the role of outcome-based education in educational practices. This cyclical process of planning, implementing, assessing, and improving ensures that the training programs remain relevant, effective, and responsive to the evolving needs of educators and researchers (Ali et al., 2024).

2.3. Sustainable Development

Meanwhile, Argento et al. (2020) Studied the integration of sustainability in higher education with a specific case in Sweden, discussing strategies for implementing sustainability education. Furthermore, Abad-Segura & González-Zamar (2021) Provided a global analysis of sustainable economic development in higher education institutions within the framework of the Sustainable Development Goals (SDGs). These studies provide a solid theoretical foundation and practical reference for this research to explore the sustainable development path of international training for Chinese university educators under the OBE concept.

However, despite the recognized importance of internationalization, there are still challenges in designing and implementing effective training programs for university educators. Some studies have noted a lack of targeted training opportunities, ineffective training methods, and insufficient evaluation mechanisms (e.g., Yang, 2020; Fe et al., 2017). These issues highlight the need for innovative training approaches that can address the specific needs of educators and ensure sustainable development of their international teaching and research capabilities.

In conclusion, the OBE framework offers a comprehensive and outcomes-driven approach to teaching and research training, particularly in the context of internationalization. By defining clear learning outcomes, aligning instructional activities, assessing learning achievement, and continuously improving based on performance data, OBE enables educators to design and implement effective training programs that foster the development of international competencies among university educators. As higher education institutions continue to embrace internationalization, the adoption of OBE principles in teaching and research training becomes increasingly important to ensure the quality and relevance of their programs in the global arena.

3. RESEARCH SETTING AND METHODOLOGY
3.1. Representative of Research Setting

The samples were selected from a university, it is in Zhengzhou, the capital of the Henan province. Henan, located in the central part of China, is the birthplace of Chinese civilization. Henan province holds the highest value and serves as a crucial development area for national policies. It has obvious regional advantages and serves as a transportation hub for the entire country. The Ministry of Education has approved the university as a provincial public undergraduate university. It is the key construction of Henan province's "demonstration." A University in Henan application technology type undergraduate university, Henan province master degree awarding project construction unit, Henan province's first batch of "assembly" construction talent training base, Henan province's first batch of "Chinese excellent culture inheritance base".

3.2. Target Interview Population

In this study, 27 teachers (Table 1 below) of different majors with overseas study, visiting study, exchange or post-doctoral study experience were randomly selected to accommodate different perspectives of different disciplines and provide inspiration and reference for teachers in later universities. These teachers were found in the following two ways: first, the International Exchange Office of the school recommended qualified teachers with overseas training experience and agreed

to be interviewed as research objects; second, they were found in a snowball way through personal networks.

Table 1: Target Interview Population

No.	Gender	Title	Research Field	Nation	Learning Type	Overseas' University	Time
A1	Male	Prof	Materials And Chemistry	French	Visiting scholar	Université Lille 1	2016
A2	Female	Prof	Management Engineering	New Zealand	Visiting scholar	University of Ottawa	2016
A3	Male	Prof	Law	USA	Visiting scholar	Pace University	2017
A4	Female	Prof	Environment Science	Singapore	Visiting scholar	Idris University of Education	2017
A5	Female	ASSOC Prof	Foreign Language	USA	Visiting scholar	University of Manchester	2018
A6	Female	Lecturer	Civil Engineering	Canada	Visiting scholar	Georgia Southwestern State University	2018
A7	Male	ASSOC Prof	Mechanical Engineering	Germany	Visiting scholar	Chamber of Commerce and Industry of Dortmund	2019
A8	Male	ASSOC Prof	Mathematics	USA	Visiting scholar	University of Nebraska	2019
A9	Male	ASSOC Prof	Foreign Language	British	Visiting scholar	University of Manchester	2020
A10	Male	ASSOC Prof	Foreign Language	Australia	Visiting scholar	University of Canberra	2020
A11	Male	Lecturer	Economics	Malaysia	Ph.D. Abroad	University of Sarawak	2019
A12	Male	Lecturer	Civil Engineering	Malaysia	Ph.D. Abroad	University of Sarawak	2019
A13	Male	ASSOC Prof	Management	Malaysia	Ph.D. Abroad	University of Sarawak	2019
A14	Female	Lecturer	Design Of Technology	Malaysia	Ph.D. Abroad	University of Canberra	2019
A15	Male	Lecturer	Management	Malaysia	Ph.D. Abroad	University of Sarawak	2019
A16	Female	ASSOC Prof	Language	Malaysia	Ph.D. Abroad	University of Sarawak	2019
A17	Female	Lecturer	Language	Malaysia	Ph.D. Abroad	University of Sarawak	2019
A18	Female	Lecturer	Economics	Malaysia	Ph.D. Abroad	University of Sarawak	2019
A19	Male	Lecturer	Finance	Malaysia	Ph.D. Abroad	University of Sarawak	2019

No.	Gender	Title	Research Field	Nation	Learning Type	Overseas' University	Time
A20	Male	Lecturer	Civil Engineering	Malaysia	Ph.D. Abroad	Marla College of Technology	2021
A21	Male	Lecturer	Language	Malaysia	Ph.D. Abroad	University of Botella	2020
A22	Female	Lecturer	Chinese Literature	Malaysia	Ph.D. Abroad	University of Botella	2020
A23	Female	Lecturer	Language	Malaysia	Ph.D. Abroad	University of Botella	2020
A24	Female	Lecturer	Pedagogy	Malaysia	Ph.D. Abroad	Idris University of Education	2020
A24	Female	ASSOC Prof	Business Management	Malaysia	Ph.D. Abroad	Marla College of Technology	2021
A25	Male	ASSOC Prof	Business Management	Malaysia	Ph.D. Abroad	Marla College of Technology	2021
A26	Female	ASSOC Prof	Business Administration	Malaysia	Ph.D. Abroad	Marla College of Technology	2021
A27	Male	Lecturer	Civil Engineering	Malaysia	Ph.D. Abroad	Marla College of Technology	2021

3.3. Implementation of the Interview

Implementation procedures for the interview method are described. Before the interview, the research team contacted the interviewees by phone, sent the interview consent and interview outline to the interviewees in advance by email or WeChat, and agreed on the specific interview time and place with the interviewees. No matter if it is a group interview or a single interview, two interviewees will participate in each interview, and each respondent will give a 20–30-minute statement on the questions according to the interview outline. The interviewees will be able to freely share their experiences, thoughts, and feelings in a relaxed and harmonious dialogue atmosphere. Listen to their inner thoughts and feelings during the interview, and get as much detail as possible. In the interview, with the consent of the interviewees, the audio was recorded with a recording pen. After the interview, the recording was transcribed word for word into written form, and follow-up calls were made to the interviewees to seek confirmation and additional insights. The researchers carefully verified the interviewees' ambiguous meaning, ambiguous facts, and inconsistent content, thus forming the final interview draft.

3.4. Ethical Considerations

In this study, all interviewees are informed in advance and agree to participate, thereby avoiding any form of deception or harassment. Confidentiality of all respondents is maintained, and the survey data is utilized solely for research purposes, encompassing the method of data usage and the timeframe for informing respondents. Informed consent is grounded in voluntary understanding and clearly outlines the conditions of anonymity and confidentiality afforded to participants. Anonymity ensures that participants' personal information remains unknown outside the research group.

4. RESEARCH FINDING

4.1. Internationalized Training Impact on Teaching and Research

Table 2 is as follows: Of the 27 interviewees, 1 was very satisfied with the results, 17 were satisfied, 4 were OK, 4 were not very satisfied, 1 was dissatisfied, and 1 was not sure. Among the 27 interviewees, the majority expressed satisfaction with the impact of overseas cross-cultural training and learning on their teaching and research, with over 81% reporting positive outcomes.

Table 2: The Satisfaction and Aspects of the Study Abroad

No.	Result of study abroad	Impact on Teaching and Research
Interviewee1	Satisfied	Both scientific research and teaching have been improved
Interviewee2	Very Satisfied	Scientific research: a great improvement in scientific research ability
Interviewee3	Not Bad	Both scientific research and teaching have been improved
Interviewee4	Satisfied	Both scientific research and teaching have been improved
Interviewee5	Satisfied	Both scientific research and teaching have been improved
Interviewee6	Not Very Satisfied	Tight schedule
Interviewee7	Not Very Satisfied	Both efficiency and effectiveness will be affected by the epidemic, and I am relatively uncertain about such a good outcome anyway.
Interviewee8	Satisfied	Both scientific research and teaching have been improved
Interviewee9	Satisfied	Both scientific research and teaching have been improved
Interviewee10	Satisfied	Both scientific research and teaching have been improved
Interviewee11	Satisfied	Both scientific research and teaching have been improved
Interviewee12	Not Very Satisfied	Satisfied: Both scientific research and teaching have been improved Not satisfied: Time is too tight. I have to juggle work, family, and academic study.
Interviewee13	Not Sure, It Depends.	The level of English, I think the investment is not proportional to the return
Interviewee14	Not Satisfied	Too busy, almost all are pushed forward, this emotional impact.
Interviewee15	Satisfied	Both scientific research and teaching have been improved
Interviewee16	Satisfied	Both scientific research and teaching have been improved
Interviewee17	Satisfied	Both scientific research and teaching have been improved
Interviewee18	Satisfied	Both scientific research and teaching have been improved
Interviewee19	Not Bad	Both scientific research and teaching have been improved
Interviewee20	Satisfied	Both scientific research and teaching have been improved
Interviewee21	Satisfied	Both scientific research and teaching have been improved
Interviewee22	Satisfied	Both scientific research and teaching have been improved
Interviewee23	Satisfied	Both scientific research and teaching have been improved
Interviewee24	Satisfied	Both scientific research and teaching have been improved

No.	Result of study abroad	Impact on Teaching and Research
Interviewee25	Not Bad	Both scientific research and teaching have been improved
Interviewee26	Satisfied	Both scientific research and teaching have been improved
Interviewee27	Not Bad	Academic and professional improvement

4.1.1. The Impact on Teaching

4.1.1.1. Teaching Methods and Materials

Cross-cultural experiences expose teachers to different classroom environments and teaching methods. For example, Interviewee 5 observed foreign teachers' serious attitude and interactive teaching style, which they attempted to replicate upon returning to their own classroom (Personal Communication, November 27, 2021). Interviewee 10 noted the emphasis on student reading in foreign classrooms and adjusted their teaching approach to encourage more self-directed reading and student participation (Personal Communication, December 6, 2021). Interviewee 8 incorporated materials and resources obtained from abroad into their teaching, utilizing the latest methods and software (Personal Communication, February 15, 2022).

4.1.1.2. Relations Between Students and Teachers

Cross-cultural learning experiences influence teachers' understanding of the teacher-student relationship. Interviewee 18 observed a more friendly relationship between foreign teachers and students compared to the traditional Chinese model (Personal Communication, November 28, 2021). Interviewee 12 reflected on their approach to student care, shifting focus from overall impact to individual learning processes (Personal Communication, January 15, 2022).

4.1.1.3. Training Methods

Cross-cultural experiences inspire innovative ideas for student development. Interviewee 10 is involved in exchange programs to enhance teaching and professional development (Personal Communication, December 6, 2021). Interviewee 9, influenced by their doctoral supervisors, adopted a more tolerant approach to student topic selection and encouraged innovation based on their understanding of methods (Personal Communication, November 28, 2021).

4.1.2. The Impact on Research

4.1.2.1. Broaden the Research Horizon

Cross-cultural experiences allow visiting scholars to broaden their research horizons by observing differences in foreign and domestic research approaches. Interviewee 6 noted the importance of vision in research and the potential to predict China's future developments by studying current Western practices (Personal Communication, November 29, 2021). These experiences often lead to the incorporation of foreign materials and data into their research upon return.

4.1.2.2. The Cultivation of Interest, Habit, and Accomplishment in Scientific Research

Cross-cultural training fosters good research habits and qualities, generating interest in scientific research. Interviewee 8 found a balance between research direction and interest, attributing part of this to the opportunities provided by their teachers abroad (Personal Communication, February 15, 2022). Even those focused on teaching, like Interviewee 16, found their life pattern shifting towards research after cross-border experiences (Personal Communication, December 6, 2021).

4.1.2.3. The Use of Scientific Tools and Methods

International activities expose teachers to cutting-edge research and advanced tools and techniques. Interviewee 10 incorporated foreign experience and data into their research, realizing the importance of understanding foreign literature for their field (Personal Communication, December 6, 2021). Interviewee 14 discussed mirroring the training methods of their foreign co-mentor, emphasizing the encouragement of probing and cross-flow research discussions (Personal Communication, November 28, 2021). Interviewee 20 recognized the gap in research methods and scientific nature between domestic and foreign institutions and aimed to align more closely with international standards (Personal Communication, November 28, 2021).

4.1.2.4. Cooperation with Foreign Scholars or Organizations

Cross-cultural experiences facilitate direct contact with foreign scholars or institutions, opening possibilities for cooperation. Interviewee 19 maintained academic exchanges with their supervisor and participated in their academic activities post-return (Personal Communication, November 28, 2021). Interviewee 11 established cooperative research relations with Australian scholars during their visit, highlighting the importance of such partnerships for future research (Personal Communication, November 28, 2021).

4.2. Problems of Internationalized Training on Teaching and Research

In the context of globalization and the knowledge economy, the internationalization of teaching and research capabilities among higher education faculty has become key to enhancing the quality of higher education and cultivating talents with international competitiveness. However, interviews suggest that Chinese university educators still face numerous challenges and deficiencies in the process of international training regarding their teaching and research capabilities.

4.2.1 Lack of Support Systems and Lagging Faculty Development

Faculty engaged in international training require extensive support from universities and all sectors of society. However, there is still a deficiency in the support systems for international training in Chinese universities. On one hand, there is a lack of specialized international training institutions and teaching staff. Teachers are the foundation of education, and faculty development is the most important foundational work for university talent cultivation, yet the construction of teaching staff for international training is seriously lagging. On the other hand, there is a lack of a comprehensive incentive mechanism and evaluation system, which makes it difficult to stimulate teachers' enthusiasm and creativity. (Personal Communication, February 15, 2022).

4.2.2 Disconnection Between Training Content and Actual Needs

Existing international training programs tend to focus on updating professional knowledge and learning cutting-edge technology, with insufficient attention to the direct improvement of teaching and research capabilities. Many teachers, after returning from abroad, although they have mastered new professional knowledge, are still confused about how to effectively integrate this knowledge into teaching and how to enhance their research capabilities (Personal Communication, December 10, 2022). In addition, the training content often overlooks the cultivation of cross-cultural communication skills and international academic standards, making it difficult for teachers to fully demonstrate their strength on the international stage.

4.2.3 Emphasis on Research Over Teaching

The dilemma of whether to prioritize teaching or research is a common concern for university teachers. Frontline teachers, especially young faculty, bear heavy teaching tasks. For some time, universities have linked the number of research projects, papers, and project funds to performance wages, evaluations, promotions, and rewards (Personal Communication, December 11, 2022). Coupled with biases in research activities and evaluations, this has led to a phenomenon in universities where research is emphasized over teaching, even resulting in "frivolous research and weak teaching." Teachers must recognize that research and teaching can promote each other and unify the two within the significant issue and core project of talent cultivation. Therefore, "teaching as a priority, research as a foundation," and "unifying teaching and research in educating people" should become the conscious adherence of university teachers.

4.2.4 Weak Concept of Integrated Teaching and Research

Most university teachers are keen on applying for projects, publishing monographs, issuing papers, and applying for various scientific research awards, yet they neglect the improvement of teaching methods and the enhancement of teaching levels. Some teachers, in order to devote more time and energy to research work, even lack the necessary sense of responsibility for daily teaching work and are indifferent to the achievement of teaching results and performance, even deliberately avoiding teaching tasks. If scientific research achievements cannot be integrated into teaching practice and the latest dynamics of scientific research cannot be reflected in teaching, the integration and promotion of teaching and research will become an empty talk.

4.2.5 Lack of Teamwork Awareness Among University Teachers

"Autonomy and freedom" are the concepts advocated by universities. Teachers in teaching and research activities are relatively unconstrained, with more personalized and independent working methods. Teachers rarely participate in team activities, and the advantages of teamwork are not well utilized. In teaching work, different disciplines, majors, and courses are relatively independent, and there is little cross-disciplinary knowledge exchange and cooperation among teachers, and there is also a lack of awareness of teamwork. In addition, a single teaching evaluation standard has also led to competition among teachers, weakening the enthusiasm for cooperation and exchange between teachers of the same discipline, resulting in a lack of teamwork awareness among teachers.

4.2.6 Inconsistency in Teaching and Research Assessment and Evaluation Mechanisms

At present, most universities have relatively independent teaching and research management, with a single assessment and evaluation mechanism for teachers' teaching and research. Research work is relatively easier to quantify than teaching work and is more likely to meet teachers' material and spiritual pursuits. Moreover, most university title evaluations are linked to research projects and achievements, with teaching work often only serving as a reference. This inconsistency in the development of teaching and research functions and the imperfection of assessment and evaluation mechanisms are not conducive to the construction of an integrated teaching and research team of teachers.

In summary, the problems faced by Chinese university educators in the international training of teaching and research capabilities not only restrict the development of individual teachers but also affect the overall internationalization process of universities. Therefore, we need to start from multiple aspects, strengthen the intensity of international training, optimize training content, improve teachers' language abilities, and improve the support system to promote the sustainable development of the internationalization of teaching and research capabilities of Chinese university educators.

5. SUSTAINABLE DEVELOPMENT SUGGESTIONS
5.1. Strengthening Inter-university Collaboration

International collaboration between universities is a beneficial supplement to domestic inter-university talent cultivation. Cooperation and exchange with foreign schools, along with the exploration and formation of talent cultivation models under the OBE philosophy during international certification and the evaluation process of Sino-foreign cooperative education conducted by the Ministry of Education, are gradually taking shape. These talent cultivation models are based on international standards, curricula, faculty, teaching methods, environments, and quality assurance. By introducing high-quality international resources and integrating localized characteristics, they actively serve the strategies of "going global" with Chinese culture, the Belt and Road Initiative, and the construction of a community with a shared future for mankind. They undertake the national mission of cultural output and aid in the distinctive international development of universities.

In terms of teaching and research cooperation, there is a joint discussion on the reform of teaching methods, curriculum system construction, and talent training programs. In terms of faculty research cooperation, scientific research resources are shared, and interdisciplinary and inter-university research cooperation is carried out based on mutual research strengths, with mutual support or joint application for major international and ministerial research projects to promote the construction and sharing of research infrastructure. In terms of campus culture, inter-university cooperation can enrich campus culture by participating in or co-hosting campus cultural festivals, innovation contests, and professional competitions with partner universities.

5.2. Building an International Teaching Model and Promoting the Construction of an International Faculty Team

On one hand, the construction of an international faculty team is strengthened by cultivating internationally certified dual-certificate teachers, building a team of teachers with both foreign teaching qualifications and domestic teacher qualifications, enhancing the level of localized international teaching, and jointly improving students' international capabilities and global perspectives through the collaboration of Chinese and foreign faculty teams. On the other hand, the teaching methods of international Sino-foreign cooperation are optimized. In line with the OBE philosophy, a capability-driven, step-by-step international teaching model is implemented, with an emphasis on guiding students' international learning capabilities. Interactive teaching, PBL (Problem-Based Learning) methods, flipped classrooms, and other teaching approaches are integrated to provide "one-on-one" feedback and personalized guidance for students based on the training objectives. A formative curriculum evaluation system that aligns with international standards is implemented, incorporating group discussions, learning reports, and outcome presentations into the curriculum evaluation system, recording and analysing the academic trends of student groups, and establishing a series of scientific and effective quantitative evaluation systems.

5.3. Building a Teaching and Research Community

Modern teaching practices require teachers to transition from being teaching-oriented to integrating teaching with research. Teaching without research leads to regression. Teaching practices require guidance from scientific research theories, and theories need to be continuously tested and refined through teaching practices. There is a mutually promoting and collaborative relationship between teaching practices and educational research. Inter-university teaching and research communities enable members to grow through exchange and mutual assistance, enhancing teachers' professional

ethics, knowledge, teaching capabilities, and research abilities, paving a new path for educational research work.

5.3.1. Integration of Teaching and Research Philosophy

The positive interaction between teaching and research involves two propositions: the mode where research reflected in teaching drives teaching and the path where teaching promotes research. These two propositions are not separate but closely connected. Regardless of how they interact and develop, teaching and research each have their own operational rules. For the development of teachers and higher education, they are not substitutes for each other but maintain equal momentum and complement each other's strengths, ultimately benefiting student development.

The integration of teaching and research means that teachers should teach based on their research areas, directions, and achievements. One of the objective conditions for the unification of teaching and research is the high relevance in content, and the construction of classroom teaching models through teaching design. The role of research in teaching also relies on methods and strategies, focusing on key and difficult points, leveraging research characteristics, making the application of research findings in teaching more planned, strategic, and orderly, rather than severing the relationship between the two. A high-level, sustainable OBE education model requires teachers to establish expected learning outcomes and break them down into operable detailed objectives. It requires teachers to choose appropriate educational strategies to achieve expected goals, which is inseparable from the development of teachers' professionalism and teaching fields. In addition, the level of students' professional skills is also one of the objective conditions for the ultimate realization of the integration of teaching and research. Senior courses in universities are more likely to have such conditions than junior courses. The subjective condition for the integration of teaching and research is the proactive construction of teachers' professional knowledge systems and their enthusiasm and interest in teaching. The manifestation of teachers' initiative mainly lies in the continuous discovery of problems, the gap between teaching design and plans and reality, the continuous discovery of how to integrate teaching and research in educational practice, exploring research problems from teaching difficulties, capturing teaching and research issues from specific teaching scenarios.

5.3.2. Teaching Design for the Integration of Teaching and Research

How to effectively combine teaching and research requires a result-oriented teaching process design. Teaching design has integrity and interrelatedness; the result is the teaching objective and talent cultivation objective. After determining the results, teaching steps that are closely linked and mutually influential are designed based on the positive interaction of teaching and research, a teaching plan is formulated, a logical narrative is determined, and relevant learning issues are planned, with blackboard writing returning to teaching objectives and talent cultivation objectives (see Figure 1). The integration of research and teaching can effectively promote the improvement of students' higher-level abilities. Quality does not depend on teaching and transmission but is based on knowledge and ability, where knowledge is the foundation of ability, and information contains knowledge but is not equal to it. The quality goals pursued by education and teaching are reflected in students' knowledge and abilities as carriers. If it is a shallow integration based on a large amount of professional information, it is a superficial level, while the improvement of ability and quality is a deep level.
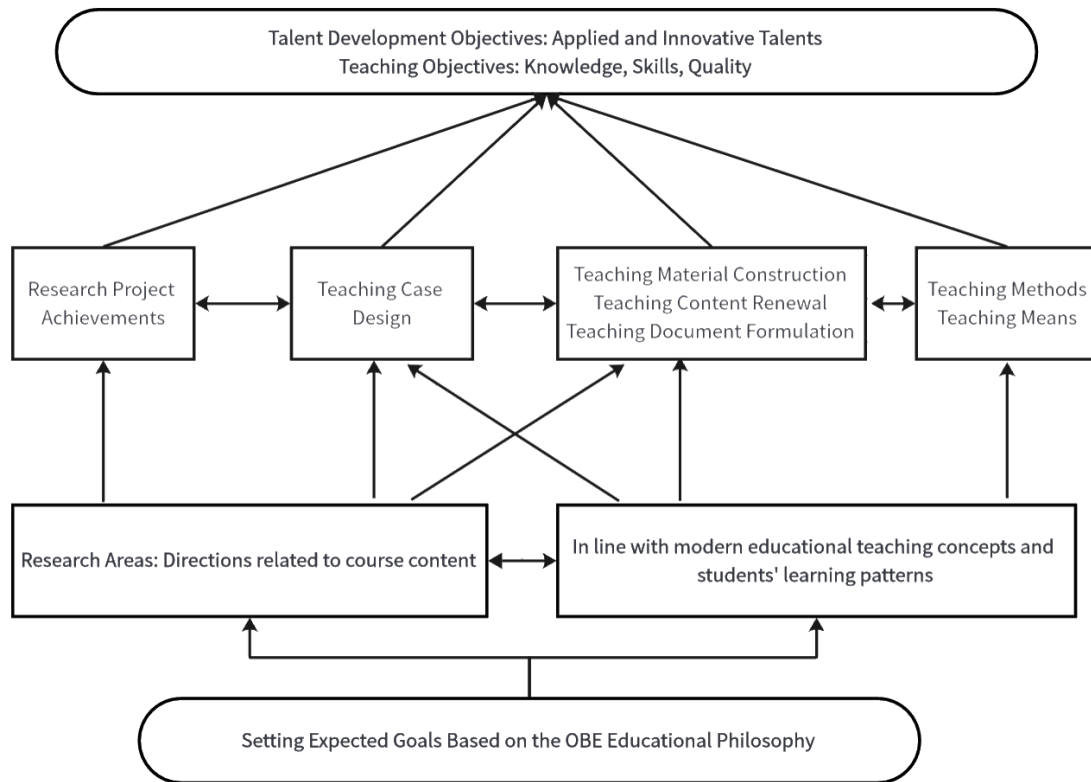
Figure 1. Integrated Teaching and Research Design Based on OBE Concept

Based on the OBE (Outcome-Based Education) concept, the integrated design of teaching and scientific research takes the OBE philosophy as its core. It aims to cultivate applied and innovative talents who have a solid foundation of knowledge, practical abilities, and innovative qualities through the deep integration of scientific research project achievements and teaching activities. The entire process reflects the transformation from scientific research achievements to teaching practice, as well as the feedback and promotion of teaching to scientific research.

Firstly, the design emphasizes the importance of "Research Areas: Directions Related to Course Content." This means that teachers should carry out teaching and research activities closely around the content of the course, supporting teaching activities with scientific research achievements to achieve mutual promotion and joint development of teaching and research.

In terms of teaching content, "Teaching Content Renewal" is key to maintaining the vitality and attractiveness of teaching. By introducing the latest scientific research achievements and industry trends in a timely manner, the teaching content is always kept up-to-date. In addition, "Teaching Document Formulation" is also an indispensable part, which requires teachers to fully consider students' learning patterns and characteristics when formulating teaching plans and lesson plans to ensure the pertinence and effectiveness of teaching activities.

Next, the design shows how to transform the achievements of scientific research projects into teaching resources. Through "Teaching Case Design" and "Teaching Material Construction," new concepts, new technologies, and new methods in scientific research achievements are integrated into the teaching content, keeping the teaching content at the forefront and practical. At the same time, the choice of "Teaching Methods" and "Teaching Means" is also crucial, as they directly affect the teaching effect and students' learning experience. Therefore, in the teaching process, it is necessary

to continuously explore and innovate teaching methods and means to adapt to students' learning needs and characteristics.

Finally, the design clarifies the "Talent Cultivation Objectives," that is, to cultivate applied and innovative talents. This is the starting point and the foothold of the entire integrated design of teaching and scientific research. To achieve this goal, clear teaching objectives need to be set in teaching activities, including three aspects: knowledge, ability, and quality. These objectives not only require students to master solid professional knowledge but also require students to have the ability to solve practical problems and good overall quality.

In summary, the integrated design of teaching and scientific research based on the OBE concept achieves deep integration and mutual promotion of teaching and research through clear talent cultivation objectives, setting teaching objectives, transforming scientific research achievements, updating teaching content, innovating teaching methods and means, and formulating teaching documents in line with students' learning patterns. It provides a strong guarantee for cultivating applied and innovative talents.

5.4. Providing Teaching and Research Training Platforms and Services

5.4.1. Teaching Capacity Training

The focus of teaching capacity training is to enhance the teaching level of teachers by providing training programs. It adheres to the concept of "combining systematic training with personalized training, and integrating online training with offline training organically." Through training, the OBE educational philosophy is integrated throughout the entire professional development process of teachers. The main training projects include: induction training for young teachers, subject skill enhancement training, information technology teaching capacity enhancement training, first-class course construction training, online teaching reform training, and social practice training for middle-aged and young teachers, etc.

5.4.2. Teaching Research Capacity

Teaching research capacity training primarily draws on successful experiences and effective practices of OBE teaching at home and abroad. It organizes exchanges and experience sharing on classroom teaching reform, teaching model innovation, classroom teaching quality standards, teaching evaluation and assessment, and the construction of teaching communities under the OBE teaching philosophy through lectures, salons, and competitions. The main service projects include: master teacher workshops, master teacher lectures, master teacher open classes, thematic teaching salons, teaching competitions, etc. The aim is to implement the "reverse design" teaching philosophy through teaching research services, providing teachers with comprehensive experience exchange and sharing services from curriculum teaching outline design, curriculum teaching implementation, curriculum assessment to continuous curriculum improvement.

5.4.3. Teaching Support Services

Teaching support services mainly ensure the conditions and resource needs for teachers' teaching reform research and classroom teaching innovation under the OBE philosophy through the construction of teacher development centres, experimental and practical training venues, information technology conditions, and teaching resources.

(1) Strengthen the construction of teaching ability training experimental sites and micro-teaching classrooms and equipment. Further integrate existing resources to provide dedicated venues for teacher teaching ability training, create a good teaching culture atmosphere that values and researches teaching, and provide a good hardware environment support for teachers.

(2) Build a high-level teacher training team combining in-school and out-of-school, full-time and part-time. A relatively stable and high-level teacher training team is an important guarantee for the improvement of teachers' teaching abilities. By recruiting from outside the school and cultivating within the school, a teacher training team is constructed to provide stable teaching strength for pre-job training for new teachers, thematic training for middle-aged and young teachers' teaching ability enhancement, teaching competition evaluation, first-class course training, professional construction, and professional certification training, etc.

(3) Improve the level of information management. By building a management information system for teacher teaching ability training, the standardized and intelligent management of teacher teaching ability training is realized. A teaching ability improvement file is established for each teacher, and decision support is provided for every link of "activity development, process management, evaluation feedback, summary and improvement" in teacher training.

In summary, this part outlines strategies for the sustainable development of higher education, including: International Collaboration, enhancing talent cultivation through OBE-based partnerships with foreign universities, supporting China's cultural and international strategies, developing globally-oriented faculty and optimizing teaching methods, establishing an international curriculum evaluation system. Promoting professional development of educators and integrating teaching with research, encouraging educators to teach based on research outcomes, closely linking teaching content with scientific inquiry, and offering diverse training programs and support services to enhance educators' teaching and research capabilities. The core is the implementation of the OBE philosophy, with a focus on international cooperation and teaching and research innovation, strengthened educator training, and the promotion of quality and effectiveness in higher education.

REFERENCES

Abad-Segura, E., & González-Zamar, M. D. (2021). Sustainable economic development in higher education institutions: A global analysis within the SDGs framework. *Journal of Cleaner Production*, *294*. https://doi.org/10.1016/j.jclepro.2021.126133

Ali, F., Minaz, M., Shehzad, S., Baig, G. N., & Ahmad, W. (2024). An Analysis of Outcome-based Education into Educational Practices at University Level. *Qlantic Journal of Social Sciences and Humanities*, *5*(1). https://doi.org/10.55737/qjss.510267290

Argento, D., Einarson, D., Mårtensson, L., Persson, C., Wendin, K., & Westergren, A. (2020). Integrating sustainability in higher education: a Swedish case. *International Journal of Sustainability in Higher Education*, *21*(6), 1131–1150. https://doi.org/10.1108/IJSHE-10-2019-0292

Fe, M., De Guzman, D., Edaño, D. C., & Umayan, Z. D. (2017). Understanding the Essence of the Outcomes-Based Education (OBE) and Knowledge of its Implementation in a Technological University in the Philippines. *Asia Pacific Journal of Multidisciplinary Research*, *5*(4).

Spady, W. (1986). Outcome-Based Education: Critical Issues and Answers. *Journal of Adolescent Health Care*, *7*(1), 68.

Su Peng, & Li Manli. (2018). The Construction on Curriculum and Teaching in General Education in Tsinghua Case:An Approach of Outcome Based Education. *Research in Higher Education of Engineering*, *2*, 7. https://doi.org/CNKI:SUN:GDGJ.0.2018-02-020

Yang, P. (2020). Humanities education reform exploration and practice under outcomes-based education (OBE). *Obrazovanie i Nauka*, *22*(2). https://doi.org/10.17853/1994-5639-2020-2-78-97

Zheng, W., Wen, S., Lian, B., & Nie, Y. (2023). Research on a Sustainable Teaching Model Based on the OBE Concept and the TSEM Framework. *Sustainability (Switzerland)*, *15*(7). https://doi.org/10.3390/su15075656