

Outcome-Based Education in the 21st Century

Innovations, Implementation and Impact

¹Edwin*, ¹Vonny A. Susanta

Affiliations:

¹Sekolah Tinggi Teologi Kingdom Bali, Indonesia

*Correspondence: edwin.sttkingdom@gmail.com

ABSTRACT

This study aims to evaluate the development of Outcome-Based Education (OBE) in the 21st century through a Systematic Literature Review of 38 scholarly articles selected based on PRISMA guidelines. The findings indicate that OBE innovations include the integration of cutting-edge technologies such as artificial intelligence, flipped classrooms, and blended learning models, which have been shown to enhance student engagement and learning outcomes. Globally, the implementation of OBE occurs through various approaches, such as the BOPPPS model, CDIO, and personalized algorithm-based learning. The impact of OBE includes improvements in critical thinking skills, communication, student satisfaction, and the employability of graduates in the job market. However, significant challenges remain, such as faculty resistance, limitations in professional training, and a lack of long-term evaluation. The study concludes that OBE holds substantial potential as an innovative framework in higher education if applied contextually and sustainably, with recommendations for future research focusing on long-term sustainability, inclusivity, and cross-cultural adaptability.

Keywords

Competency-Based Learning
Educational Technology
Employability
Outcome-Based Education
Student Engagement
Systematic Literature Review

APSA

Advances in Psychological Sciences and Applications

Vol. 1, No. 02, pp. 48-72

Copyright: © 2025 by the authors. Licensee IISTR, Yogyakarta, Indonesia. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution-ShareAlike 4.0 International ([CC-BY-SA](https://creativecommons.org/licenses/by-sa/4.0/)) license.

Article history

Received 14 June 2025

Revised 26 June 2025

Accepted 28 June 2025



journal.iistr.org/index.php/APSA

DOI: 10.56741/apsa.v1i02.1105

Introduction

Outcome-Based Education (OBE) has emerged as a transformative shift in education during the 21st century, driven by the increasing necessity for educational frameworks to better align with the demands of the real world. This approach emphasizes achieving specific learning outcomes rather than simply focusing on content delivery. Its primary objective is to ensure that students acquire not only theoretical knowledge but also the practical skills and competencies essential for success in today's rapidly evolving global environment, ultimately contributing to socioeconomic advancement [1], [2].

The relevance of OBE has grown significantly on a global scale, as both educators and policymakers seek to improve the quality and applicability of educational practices. Research indicates that aligning educational systems with well-defined learning outcomes enables institutions to respond more effectively to the challenges of an ever-changing world. Compared to conventional educational models, OBE fosters deeper engagement and equips students with the necessary skills to navigate real-world complexities, particularly in fields where competency and expertise are crucial to success [3].

Innovations in OBE have led to significant changes in teaching methodologies and assessment practices. Traditional forms of evaluation are being gradually replaced by more dynamic and learner-centred approaches that more accurately assess the attainment of predetermined outcomes[2]. The development of new assessment tools has facilitated a more precise tracking of learning outcomes, enhancing both student performance and participation. This shift in teaching and assessment strategies reflects a broader trend in higher education aimed at creating environments that prioritize critical thinking, creativity, and problem-solving—skills that are essential for future employability [1], [4].

Nonetheless, the adoption of OBE introduces a range of challenges [5]. Its successful implementation requires a comprehensive, collaborative approach involving all stakeholders—educators, administrators, policymakers, and students—to ensure that curriculum design, teaching delivery, and assessments are effectively aligned with desired outcomes. Moreover, the significance of continuous feedback and robust quality-assurance mechanisms cannot be overstated, as these are pivotal in fostering the ongoing refinement and success of OBE programs [3].

The purpose of this study is to present a thorough and systematic literature review of Outcome-Based Education in the context of the 21st century. It will explore significant innovations, effective implementation strategies, and the impact of OBE on education. By synthesizing findings from diverse academic sources, the study aims to provide a clearer understanding of how OBE is shaping contemporary education and its potential for future transformation.

This research offers a novel perspective by conducting a systematic review focused specifically on Outcome-Based Education in the 21st century. While OBE has been the subject of numerous studies, few have provided a comprehensive review of its innovations, implementation challenges, and long-term effects within the context of global education. By examining a broad range of academic articles, policy documents, and educational case studies, this study provides fresh insights into the ongoing evolution of OBE.

The contribution of this study lies in its potential to influence educational policy and practice by offering evidence-based recommendations for effectively implementing OBE. The findings could serve as a valuable resource for educators, administrators, and policymakers looking to enhance curriculum design and teaching methods. Furthermore, the study's synthesis of existing research can help identify gaps in current knowledge, directing future research initiatives in the field of OBE.

Method

This study utilizes a systematic literature review to examine OBE, focusing on its innovations, implementation, and impact. The review process begins with a comprehensive search using keywords such as "OBE" and "Outcome-Based Education," followed by a two-stage selection process and quality evaluation. Data extraction concentrates on the type of studies, OBE practices, and performance indicators, with the results analyzed through narrative synthesis, and thematic analysis. The review also identifies potential biases and strives to provide valuable, practical insights for educators regarding the innovations, implementation strategies, and overall impact of OBE.

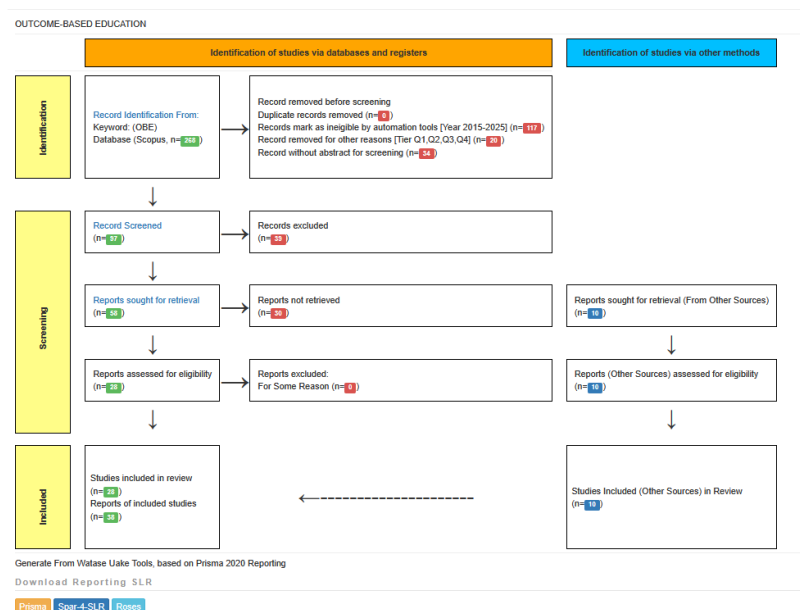


Figure 1. Steps for a Systematic Literature Review

Figure 1 represents the systematic approach used for the literature review on OBE, adhering to PRISMA guidelines. Initially, 268 records were identified from academic databases such as Scopus, with 10 additional studies found through other methods. During the screening phase, 57 records were reviewed, and 35 were excluded due to irrelevance. Full-text retrieval was requested for 58 reports, but 30 could not be accessed.

The 28 reports were added with 10 reports which are from other relevant sources. In the end, 38 related reports were considered for further analysis. This process ensures that only high-quality studies are used to examine the innovations, challenges, and impact of OBE in modern education.

Result And Discussion

To deliver a clearer perspective on the geographical provenance of the analyzed articles, a thorough examination of their distribution by country has been conducted. Figure 2 presents a pie chart titled "Categorization of Articles by Country," which illustrates this distribution. The largest portion, comprising 78.9%, is labeled as "Unidentified," indicating that a substantial number of articles do not specify a clear country of origin. The remaining segments represent countries including Australia, Bangladesh, China, Malaysia, Oman, Saudi Arabia, and South Africa, each contributing a relatively small share, with the highest individual country contribution being 5.3%. This distribution highlights that the majority of articles in the dataset are not associated with a specific country, while a limited number of countries account for only a minor proportion of the total.

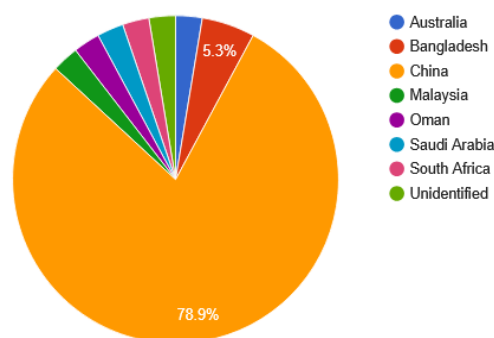


Figure 2. Categorization of Articles by Country

To gain a comprehensive understanding of the methodological frameworks employed in the reviewed literature, an analysis of the distribution of research methods was conducted. Figure 3 presents a pie chart titled "Categorization of Research Methods," which categorizes the articles based on their research methods.

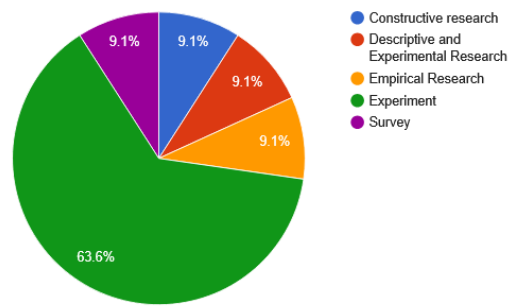


Figure 3. Categorization of Research Methods

The chart reveals that the majority of articles (63.6%) utilized constructive research, making it the predominant methodological approach within the dataset. Meanwhile, smaller segments—each accounting for 9.1%—represent other research methods, including descriptive and experimental research, empirical research, experiment, and survey. This distribution underscores the dominance of constructive research in the reviewed literature, while the other methods contribute equally but to a notably lesser extent.

Innovation in Outcome-based Education

Tabel 1. Innovations in Outcome-based Education

No	Research Title	Subject	Result
1	A Practical Study of Computer-Assisted College English Intelligent Teaching Course Based on OBE Theory [6].	Students	The author innovatively combined the Rain Classroom platform with OBE theory to design an intelligent teaching model for college English.
2	Research on the enhancement of informatization literacy of design practice teaching faculty in applied colleges and universities based on OBE model in the context of artificial intelligence [7].	University Students	Innovation lies on "one-core, six-double" model for design talent development based on OBE
3	Research on the Optimization Pathways of University Education and Teaching Reform based on OBE Concepts by Jingjing Huang [8].	University Students	The author integrated OBE theory with a dynamic curriculum map and personalized course recommendations.
4	A Study on the Strategy to Improve the Informatization Teaching Ability of Teachers in Higher Education Institutions Based on OBE Concept [9].	Teachers	Innovate teaching model of teachers' informatization teaching ability improvement with the OBE concept as the core
5	New model of college physical education teaching based on the algorithm and data structure of flipped classroom and OBE [10].	College Students	A personalized learning system using genetic algorithms optimizes college PE teaching.
6	Reform and Exploration of Multidimensional Aviation Service Teaching Mode Based on OBE [11].	Students	The study explores aviation service teaching model under the OBE concept
7	A Study on the Innovation of University English Teaching Mode by Integrating OBE and Mixed Reality Technology [12].	Students	The idea of OBE is mixed with reality technology

No	Research Title	Subject	Result
8	Construction of a Multidimensional Assessment Model of Modern Apprenticeship Cultivation Effect and Creation of "Embedded" Dual-Teacher Teaching Teams under the OBE Concept [13].	Vocational College Students	The authors combine fuzzy evaluation and machine learning to assess apprenticeship and dual-teacher team effectiveness.
9	Innovative integration of the "W + Flipped Classroom" and "B + BOPPPS" teaching models for enhanced learning outcomes [14].	University Students	The study innovatively combined "W + flipped classroom" with "B + BOPPPS" blended teaching models
10	Research on the Hybrid Teaching Model of Piano in Normal Universities Based on "OBE + Politics Integrated Courses [15].	Student	The author integrates OBE with ideological and political education in piano teaching.
11	Application of Outcome-Based Education Instructional Theory Based on Artificial Intelligence in the Design and Practice of Research Curriculum [16].	Students	An innovative approach by integrating OBE with AI in designing and assessing research curriculums, utilizing big data and ANN to optimize instructional evaluation
12	Analysis of Factors Influencing the Quality of Teaching Mathematics and Applied Mathematics under the Orientation of OBE Philosophy [17].	Student	The authors introduce an OBE-based teaching model that integrates mathematical modeling concepts.
13	Developing a BOPPPS (Bridge-in, Objectives, Pre-assessment, Participatory Learning, Post-assessment and Summary) model combined with the OBE (Outcome Based Education) concept to improve the teaching outcomes of higher education [18].	Undergraduate Students	Innovatively developed the BOPPPS teaching model combined with the OBE concept to enhance teaching outcomes in medical laboratory technology programs.
14	Multi-method Integrated Experimental Teaching Reform of a Programming Course Based on the OBE-CDIO Model Under the Background of Engineering Education [19].	Students	This study introduces a multi-method integrated experimental teaching reform that combines the OBE-CDIO model with project-based learning, micro-video teaching, and industry-academia.
15	Innovative Reform of Blended Teaching in Statistics Practice Class of Economics and Management under OBE Concept Orientation [20].	University Students	The author uses group recommendation and Attractor algorithms to personalize blended teaching in statistics.
16	Inclination of Teachers to Implement Outcome-Based Education in English Courses in Saudi Universities [21].	English Language Teachers	The study offers an innovative perspective by examining Saudi university English teachers' inclination to adopt OBE
17	Analysis and Countermeasures of Cultivating Independent Learning Ability in Colleges Teaching English Based on OBE Theory [22].	College Students	The focus is on innovatively enhancing college students' academic communication and practical skills in literature reading, paper writing, and international conference engagement.
18	Engineering Curriculum Reform Based on Outcome-Based Education and Five-Color Psychology Theory [23].	Students	Integrates the OBE model with five-color psychological theory to enhance students' sustainability skills and academic performance.
19	Study on the construction and practice of blended teaching mode of emergency first aid specialty based on OBE concept [24].	Undergraduate Students	The authors combined online and offline methods to create a blended OBE model focused on learning output goals.

No	Research Title	Subject	Result
20	Factors affecting student readiness towards OBE implementation in engineering education Evidence from a developing country [25].	Engineering Students	A comprehensive instrument measures student readiness for OBE, focusing on awareness, commitment, and self-efficacy
21	Research and Practice of the BOPPPS Teaching Model Based on the OBE Concept in Clinical Basic Laboratory Experiment Teaching [26].	Undergraduate Students	The authors combined the BOPPPS model with OBE.
22	Construction and practice of training system for dance professionals based on OBE teaching model combined with Kinect motion capture technology [27].	Professional Dancers	The innovation combines the OBE model with Kinect motion capture technology.
23	Research on a Sustainable Teaching Model Based on the OBE Concept and the TSEM Framework [28].	Undergraduate Students	Focus on the innovation in OBE by integrating the OBE concept with the TSEM framework to design a sustainable teaching model for computer science students.
24	OBE Concept for New Training Mode of Electronic Information Science and Technology Professionals under Big Data Analysis [29].	University Students	The author innovated by integrating big data analysis with the OBE concept.
25	Outcome Based Education (OBE) Defining the Process and Practice for Engineering Education [30].	Engineering Students	A comprehensive OBE framework for engineering education aligns with local and international standards.
26	Study on OBE Teaching Concept in the Context of Deep Learning for the Construction of University Mathematics Microcourses [31].	University Students	The authors integrate OBE with AI and deep learning, using the Apriori algorithm and ACO.
27	Construction of OBE Concept Autonomous Learning Mode in University Teaching Based on the Internet [32].	University students	The innovation integrates OBE with IoT technology to create a digital, autonomous learning model for flexible, self-directed university learning.
28	Construction and application of SPOC-based flipped classroom teaching mode in Installation Engineering Cost curriculum based on OBE concept [33].	Student	The SPOC-based flipped classroom model integrates OBE.
29	Outcome-based personalised learning measurement tool for engineering education at INTI International University - INTI OBE tool (IOBET) [34].	Student	The authors developed the INTI OBE Tool (IOBET), an Excel-based program that tracks learner achievements against program outcomes for personalized learning
30	Evaluating the Role of the Communication Skills of Engineering Students on Employability According to the OBE Theory [35].	Engineering Students	Investigate innovations in OBE through the development of the CS-OBE model.

Analysis of Table 1 indicates that the OBE approach has developed into a versatile conceptual framework, applicable in various higher education contexts. The documented innovations not only reflect localized adjustments to OBE but also introduce new instructional models that integrate cutting-edge technologies, hybrid teaching frameworks, and flexible mechanisms for assessing learning outcomes. While most studies originate from developing nations—particularly China—the quality and scope of these innovations display significant

conceptual depth and pedagogical sophistication, suggesting a growing global relevance and potential for wider implementation [6][8][28].

A major trend in OBE innovation is the incorporation of advanced digital technologies. For example, Wang's CS-OBE model connects engineering students' communication skills with employability, demonstrating the role of OBE in aligning graduate attributes with market needs [23]. Another study introduced a data-driven research curriculum that integrates artificial intelligence (AI), big data, and artificial neural networks (ANN) to predict and assess student learning outcomes within the OBE framework [16]. Additionally, the use of Kinect motion capture to design performance-based assessments for dance professionals highlights how OBE evaluation is applied within the field of performative arts education [27].

In addition to technological advancements, several studies focus on personalizing learning using algorithmic and data-driven methods. One study applied genetic algorithms to physical education instruction to optimize individualized learning pathways [10], while another employed group recommendation and Attractor algorithms to enhance statistical teaching within a personalized blended learning environment [20]. The development of tools such as the INTI OBE Tool (IOBET)—an Excel-based program that tracks students' achievement of learning outcomes—demonstrates the potential of OBE as a framework for monitoring individual progress and aligning curricula accordingly [34].

Blended and flipped learning models are also central to many OBE innovations. One study creatively combined the “W + flipped classroom” model with the “B + BOPPPS” structure, illustrating how combining two pedagogical strategies can enhance active learning within the OBE framework [14]. Similarly, the integration of ideological and political education within OBE-based piano instruction exemplifies how local sociocultural goals can be embedded within competency-driven learning designs [15].

Instructional models like CDIO (Conceive, Design, Implement, Operate) and BOPPPS (Bridge-in, Objectives, Pre-assessment, Participatory Learning, Post-assessment, Summary) are often integrated into OBE-based reforms. For instance, one study utilized the BOPPPS model in clinical laboratory teaching to increase engagement and improve learning outcomes [18]. Another combined OBE with CDIO and multi-method project-based learning in programming courses, underscoring the compatibility of OBE with experiential and design-oriented pedagogies [19].

Beyond student-centered approaches, some studies emphasize the importance of institutional readiness and faculty development. A study examining English language teachers in Saudi Arabian universities found that teachers' willingness to implement OBE is largely influenced by their professional development experiences and institutional support structures

[21]. Similarly, another study developed a faculty training model to enhance informatics teaching skills, with OBE serving as the central philosophy for improving pedagogical practices [9].

The collective insights from Table 1 indicate that the role of OBE has broadened significantly—from a framework for assessing student outcomes to a driving force for educational innovation and curricular reform. The integration of AI, big data, flipped classroom techniques, learner tracking tools, and hybrid pedagogical models points to a new trajectory in global higher education reform, especially in Asian contexts. However, despite the promising design and implementation strategies of these innovations, their long-term effectiveness requires further exploration through longitudinal research and cross-institutional collaboration. Future research should assess not only the effectiveness of these models within specific local contexts but also their adaptability and scalability across diverse educational systems [6][10][14][19][16][23][34].

Implementation of Outcome-based Education

Tabel 2. Implementation of Outcome-based Education

No	Research Title	Subject	Result
1	A Practical Study of Computer-Assisted College English Intelligent Teaching Course Based on OBE Theory [6].	Students	he OBE-based smart teaching model was implemented through blended learning, integrating online, classroom, and after-class activities using the Rain Classroom platform.
2	Research on the enhancement of informatization literacy of design practice teaching faculty in applied colleges and universities based on OBE model in the context of artificial intelligence [7].	University Students	The OBE model was implemented through a teacher informatization literacy evaluation system and statistical methods.
3	Research on the Optimization Pathways of University Education and Teaching Reform based on OBE Concepts by Jingjing Huang [8].	University Students	OBE was implemented through a dynamic curriculum map with a recommendation algorithm for personalized learning.
4	A Study on the Strategy to Improve the Informatization Teaching Ability of Teachers in Higher Education Institutions Based on OBE Concept [9].	Teachers	The paper constructs an information-based instructional design framework based on the OBE concept, focusing on implementation through definition, execution, and evaluation.
5	New model of college physical education teaching based on the algorithm and data structure of flipped classroom and OBE [10].	College Students	OBE is integrated with flipped classrooms and personalized learning to improve teaching.
6	Reform and Exploration of Multidimensional Aviation Service Teaching Mode Based on OBE [11].	Students	This study implemented a multidimensional aviation service teaching model based on OBE, optimizing curriculum, teaching strategies, and evaluation methods to enhance student outcomes

No	Research Title	Subject	Result
7	A Study on the Innovation of University English Teaching Mode by Integrating OBE and Mixed Reality Technology [12].	University Students	Applying OBE by focusing on defined learning outcomes and utilizing technology to enhance student achievement.
8	Construction of a Multidimensional Assessment Model of Modern Apprenticeship Cultivation Effect and Creation of "Embedded" Dual-Teacher Teaching Teams under the OBE Concept [13].	Vocational College Students	OBE aligns curriculum with demands, focusing on learning outcomes and integrating practical training.
9	Innovative integration of the "W + Flipped Classroom" and "B + BOPPPS" teaching models for enhanced learning outcomes [14].	University Students	The experimental group applied the integrated teaching models in a Biological Separation Engineering course
10	Research on the Hybrid Teaching Model of Piano in Normal Universities Based on "OBE + Politics Integrated Courses [15].	Student	OBE is implemented by setting clear objectives and using a mix of in-person and online methods, with varied assessments.
11	Application of Outcome-Based Education Instructional Theory Based on Artificial Intelligence in the Design and Practice of Research Curriculum [16].	Students	The article implements OBE by developing an instructional assessment model using big data and AI to enhance curriculum design, teaching, and student outcomes.
12	Analysis of Factors Influencing the Quality of Teaching Mathematics and Applied Mathematics under the Orientation of OBE Philosophy [17].	Student	The OBE teaching model is implemented through a comprehensive approach that combines teaching goals, content, methods, and evaluations.
13	Developing a BOPPPS (Bridge-in, Objectives, Pre-assessment, Participatory Learning, Post-assessment and Summary) model combined with the OBE (Outcome Based Education) concept to improve the teaching outcomes of higher education [18].	Undergraduate Students	The OBE concept was implemented by aligning course outcomes with knowledge, skills, and quality objectives, dividing them into index points to guide course content and teaching activities.
14	Multi-method Integrated Experimental Teaching Reform of a Programming Course Based on the OBE-CDIO Model Under the Background of Engineering Education [19].	Students	The OBE-CDIO model was implemented in the C Language Programming course by integrating teaching content, resources, and methods to enhance practical skills, teamwork, and innovation.
15	Innovative Reform of Blended Teaching in Statistics Practice Class of Economics and Management under OBE Concept Orientation [20].	University Students	A blended teaching model is designed integrating OBE, focusing on outcomes, content, and evaluation.
16	Inclination of Teachers to Implement Outcome-Based Education in English Courses in Saudi Universities [21].	English Language Teachers	The study implements OBE through a survey assessing English teachers' willingness to adopt OBE in teaching, learning, and student performance evaluation.
17	Analysis and Countermeasures of Cultivating Independent Learning Ability in Colleges Teaching English Based on OBE Theory [22].	College Students	The OBE teaching mode helps the Ministry of Education analyze the English knowledge and learning skill needs of science and engineering college students.

No	Research Title	Subject	Result
18	Engineering Curriculum Reform Based on Outcome-Based Education and Five-Color Psychology Theory [23].	University students	The implementation of OBE in Xihua University's hydraulic engineering course uses the 'One Center, Two Platforms, and Three Education' model, boosting student engagement and outcomes.
19	Study on the construction and practice of blended teaching mode of emergency first aid specialty based on OBE concept [24].	Undergraduate Students	The blended OBE model used flipped classrooms, case analysis, and group discussions to achieve learning outcomes.
20	Factors affecting student readiness towards OBE implementation in engineering education Evidence from a developing country [25].	Engineering Students	OBE is assessed through a survey evaluating readiness factors like commitment, support, and easiness.
21	Research and practice of the BOPPPS teaching model based on the OBE concept in clinical basic laboratory experiment teaching [26].	Medical Laboratory Students	They applied the OBE concept via BOPPPS with continuous evaluation.
22	Construction and practice of training system for dance professionals based on OBE teaching model combined with Kinect motion capture technology [27].	Professional Dancers	OBE is implemented using the SAA-training model and Kinect technology to meet job market and educational needs.
23	Research on a Sustainable Teaching Model Based on the OBE Concept and the TSEM Framework [28].	Undergraduate Students	The OBE concept, alongside the TSEM framework, is implemented at NingboTech University to design a curriculum aligning students' learning outcomes with their computer science competencies
24	OBE Concept for New Training Mode of Electronic Information Science and Technology Professionals under Big Data Analysis [29].	University Students	The OBE concept was implemented by creating a modular curriculum system based on professional skills and aligning it with industry needs.
25	Outcome Based Education (OBE) Defining the Process and Practice for Engineering Education [30].	Engineering Students	OBE is implemented by defining PEOs, PLOs, CLOs, and a CQI process.
26	Study on OBE Teaching Concept in the Context of Deep Learning for the Construction of University Mathematics Microcourses [31].	University Students	OBE is implemented by creating personalized learning paths using AI algorithms.
27	Construction of OBE Concept Autonomous Learning Mode in University Teaching Based on the Internet [32].	University students	The implementation creates a curriculum system using micro-course resources to promote autonomous learning, guided by the OBE concept for structure and goals.
28	Construction and application of SPOC-based flipped classroom teaching mode in Installation Engineering Cost curriculum based on OBE concept [33].	Student	OBE is applied through SPOC-based flipped classrooms, combining online learning, class discussions, and evaluations.
29	Outcome-based personalised learning measurement tool for engineering education at INTI International University - INTI OBE tool (IOBET) [34].	Student	The authors implemented IOBET to track course and program outcome attainments for individual students.
30	Evaluating the Role of the Communication Skills of Engineering Students on	Engineering Students	Implement OBE theory in engineering education with a focus on the verbal

No	Research Title	Subject	Result
	Employability According to the OBE Theory [35].		and non-verbal communication skills of students to enhance employability

Analysis of Table 2 highlights the varied and systematic approaches taken to implement OBE across different institutional, disciplinary, and technological settings. These strategies focus not only on aligning teaching content with the intended learning outcomes but also on structuring instructional design, assessment models, and delivery mechanisms in accordance with OBE principles. Although much of the evidence is derived from educational systems in Asia, particularly China and Saudi Arabia, the diverse range of implementation strategies demonstrates the flexibility and adaptability of OBE in facilitating student-centered, outcome-oriented instruction across different cultures and disciplines [6][7][21].

A widely adopted implementation strategy is the integration of blended learning models, which combine online, in-class, and after-class components. For instance, a smart teaching model for college English that utilizes the Rain Classroom platform integrates OBE by incorporating technology-enabled interaction within a blended learning structure [6]. Similarly, the use of SPOC-based flipped classrooms to deliver engineering cost courses illustrates how modular, interactive course formats can facilitate the attainment of learning outcomes through active learning and continuous feedback [33]. These models demonstrate how digital tools and flexible delivery modes can make the OBE approach more adaptable to learners' needs and paces of learning.

Another key approach is the application of instructional design models that are based on clear outcomes and structured pedagogical processes. Studies that implement the BOPPPS model—an instructional framework emphasizing objectives, assessment, and participatory learning—within clinical laboratory and biological sciences curricula exemplify this strategy [14][18][26]. The use of BOPPPS ensures that course activities align with the intended learning outcomes, promoting consistency between instructional inputs and evaluation mechanisms. Additionally, one study integrated the CDIO model with OBE to reform a programming course, further emphasizing a project-based, hands-on approach that connects theory with practical competencies [19].

Technological innovation also plays a pivotal role in many OBE implementation efforts. For example, the incorporation of big data and artificial intelligence to design and assess research curricula demonstrates the use of predictive analytics in curriculum development and student evaluation [16]. Another study applied Kinect motion capture and a SAA-training model to align dance training with labor market competencies, illustrating the applicability of OBE in vocational and performance-based education [27]. Furthermore, the use of AI-powered personalized

learning paths to support mathematics microcourses demonstrates OBE's potential to integrate with adaptive learning technologies [31].

OBE is also implemented through curricular restructuring that emphasizes modularization, outcome mapping, and competency frameworks. One study introduced the INTI OBE Tool (IOBET), an Excel-based personalized assessment platform, illustrating how institutions can systematically and quantitatively track individual learning outcome achievements [34]. Other implementations focus on creating curriculum maps and recommendation systems to personalize learning experiences and ensure they align with defined competencies [8][29].

Several studies also focus on instructor and institutional-level implementation. For instance, one study evaluated English language teachers' willingness to adopt OBE, revealing that teacher attitudes and professional development play crucial roles in effective implementation [21]. Another explored how to enhance teachers' informatization teaching abilities by developing an OBE-aligned instructional design framework [9]. These approaches highlight the importance of institutional support and instructor readiness, in addition to student engagement, for successful OBE implementation.

Moreover, many implementations incorporate evaluation and feedback systems as integral components of OBE. For example, engineering education reforms define clear Program Educational Objectives (PEOs), Program Learning Outcomes (PLOs), and Course Learning Outcomes (CLOs), all connected by a Continuous Quality Improvement (CQI) process, ensuring that feedback loops foster ongoing improvement of instructional quality [30]. Another study utilized survey instruments to assess factors such as student motivation, self-efficacy, and institutional support, offering valuable insights into the enablers and barriers to OBE adoption [25].

The findings from Table 2 suggest that OBE implementation involves not only aligning teaching with learning outcomes but also a broader transformation of curriculum structure, pedagogy, technology use, and institutional culture. From flipped classrooms and smart platforms to AI-driven assessment models and modular curricula, the studies reveal a multifaceted effort to integrate OBE into the core of educational practices. However, since many of these studies are context-specific and relatively recent, future research should aim to assess the long-term sustainability and impact of these implementations through empirical, cross-institutional, and longitudinal approaches [6][14][16][19][26][30][34].

The Impact of Outcome-based Education

Tabel 3. Impact of Outcome-based Education

No	Research Title	Subject	Result
1	A Practical Study of Computer-Assisted College English Intelligent Teaching Course Based on OBE Theory [6].	Students	Significantly improved the interaction, communication, and learning satisfaction of students.
2	Research on the enhancement of informatization literacy of design practice teaching faculty in applied colleges and universities based on OBE model in the context of artificial intelligence [7].	University Students	Improved faculty informatization literacy and teaching quality
3	Research on the Optimization Pathways of University Education and Teaching Reform based on OBE Concepts by Jingjing Huang [8].	University Students	Reformed courses improved students' perceptions of course effectiveness, teacher teaching, and learning.
4	A Study on the Strategy to Improve the Informatization Teaching Ability of Teachers in Higher Education Institutions Based on OBE Concept [9].	Teachers	Strong teacher engagement with informatization teaching
5	New model of college physical education teaching based on the algorithm and data structure of flipped classroom and OBE [10].	College Students	Students show improved air volleyball skills
6	Reform and Exploration of Multidimensional Aviation Service Teaching Mode Based on OBE [11].	Students	Significant improvements in various competencies, including knowledge literacy, communication skills, and service literacy.
7	A Study on the Innovation of University English Teaching Mode by Integrating OBE and Mixed Reality Technology [12].	Students	The improvement of English proficiency of the experimental group is better than that of the control group
8	Construction of a Multidimensional Assessment Model of Modern Apprenticeship Cultivation Effect and Creation of "Embedded" Dual-Teacher Teaching Teams under the OBE Concept [13].	Vocational College Students	Improves students' skills but needs more focus on fostering creativity.
9	Innovative integration of the "W + Flipped Classroom" and "B + BOPPPS" teaching models for enhanced learning outcomes [14].	University Students	Significantly improved academic performance, critical thinking, and student satisfaction
10	Research on the Hybrid Teaching Model of Piano in Normal Universities Based on "OBE + Politics Integrated Courses [15].	Student	OBE improves students' piano skills, expressiveness, and understanding of ideological education.
11	Application of Outcome-Based Education Instructional Theory Based on Artificial Intelligence in the Design and Practice of Research Curriculum [16].	Students	Students' creativity and practical abilities are significantly enhanced.
12	Analysis of Factors Influencing the Quality of Teaching Mathematics and Applied Mathematics under the Orientation of OBE Philosophy [17].	Student	Learning habits, learning ability, motivation, teaching environment, and learning environment positively impact the quality of mathematics teaching.
13	Developing a BOPPPS (Bridge-in, Objectives, Pre-assessment, Participatory Learning, Post-assessment and Summary) model combined with the OBE (Outcome Based Education) concept to improve the teaching outcomes of higher education [18].	Undergraduate Students	Significantly impact on student learning outcomes, improved mastery of knowledge and application skills.

No	Research Title	Subject	Result
14	Multi-method Integrated Experimental Teaching Reform of a Programming Course Based on the OBE-CDIO Model Under the Background of Engineering Education [19].	Students	Improved student performance in terms of programming skills, problem-solving abilities, and innovation.
15	Innovative Reform of Blended Teaching in Statistics Practice Class of Economics and Management under OBE Concept Orientation [20].	University Students	Improves students' problem-solving and academic performance
16	Inclination of Teachers to Implement Outcome-Based Education in English Courses in Saudi Universities [21].	English Language Teachers	Leads to positive teacher inclinations, without being affected by biodemographic factors such as gender, age, or educational level
17	Analysis and Countermeasures of Cultivating Independent Learning Ability in Colleges Teaching English Based on OBE Theory [22].	College Students	Not only improves the adaptability of college students' English teaching but also improves their independent learning ability in English learning
18	Engineering Curriculum Reform Based on Outcome-Based Education and Five-Color Psychology Theory [23].	Students	Significant improvements in student achievement, particularly in independent learning, innovation, and practical skills.
19	Study on the construction and practice of blended teaching mode of emergency first aid specialty based on OBE concept [24].	Undergraduate Students	The OBE-based blended teaching model improved students' academic performance, critical thinking, and learning outcomes.
20	Factors affecting student readiness towards OBE implementation in engineering education Evidence from a developing country [25].	Engineering Students	OBE impacts readiness, with awareness and easiness improving student engagement.
21	Research and practice of the BOPPPS teaching model based on the OBE concept in clinical basic laboratory experiment teaching [26].	Medical Laboratory Students	Boosted student engagement, clinical skills, and satisfaction.
22	Construction and practice of training system for dance professionals based on OBE teaching model combined with Kinect motion capture technology [27].	Professional Dancers	The impact results in three types of dance professionals: compound, market-experienced, and innovative dancers, with varying success.
23	Research on a Sustainable Teaching Model Based on the OBE Concept and the TSEM Framework [28].	Undergraduate Students	Significantly impact on students' learning outcomes, student engagement, practical skills, innovation capabilities, and overall competence development
24	OBE Concept for New Training Mode of Electronic Information Science and Technology Professionals under Big Data Analysis [29].	University Students	Improved the alignment between students' skills and social needs, increasing employability.
25	Outcome Based Education (OBE) Defining the Process and Practice for Engineering Education [30].	Engineering Students	OBE ensures engineering graduates meet essential competencies for success.
26	Study on OBE Teaching Concept in the Context of Deep Learning for the Construction of University Mathematics Microcourses [31].	University Students	Improve learning outcomes and customize the learning experience according to student feedback.
27	Construction of OBE Concept Autonomous Learning Mode in University Teaching Based on the Internet [32].	University students	The study shows that students' engagement and learning effectiveness improved significantly.

No	Research Title	Subject	Result
28	Construction and application of SPOC-based flipped classroom teaching mode in Installation Engineering Cost curriculum based on OBE concept [33].	Student	Improved student performance, motivation, participation, and satisfaction.
29	Outcome-based personalised learning measurement tool for engineering education at INTI International University - INTI OBE tool (IOBET) [34].	Student	Provides a detailed, individual learning progress report, helping lecturers identify areas for improvement and enhancing student learning outcomes.
30	Evaluating the Role of the Communication Skills of Engineering Students on Employability According to the OBE Theory [35].	Engineering Students	Significantly impact of communication skills, with results indicating a strong influence of communication skills in improving career prospects

Analysis of Table 3 reveals that the implementation of OBE has led to measurable positive effects across various aspects of higher education, including student academic performance, engagement, employability, communication skills, creativity, and teacher development. The wide range of studies shows that OBE not only facilitates structured curriculum alignment and assessment but also enriches students' overall learning experiences and competency development [6][7][8].

A consistent finding across the studies is the improvement in student learning outcomes, both cognitive and practical. For example, the application of OBE in English language teaching notably enhanced student interaction, communication, and overall satisfaction with their learning experience [6]. Similarly, students in engineering and computer science courses demonstrated significant advancements in programming skills, problem-solving, and innovation following multi-method experimental teaching reforms based on the OBE-CDIO model [19]. A study on statistics-based learning also showed a direct impact on problem-solving abilities and academic performance, highlighting the effectiveness of OBE in quantitative subjects [20].

The impact of OBE on professional and practical competencies is also significant. For instance, vocational students trained under OBE frameworks developed stronger communication, service, and job-specific skills in fields like aviation, emergency first aid, and dance [6][19][22]. One study even categorized dance trainees into distinct professional groups—compound, market-experienced, and innovative—based on the varying outcomes of OBE-aligned training models [27]. In engineering, the enhancement of verbal and non-verbal communication skills was identified as a key factor in improving employability, emphasizing the practical application of OBE [35].

Several studies highlight that OBE also promotes independent learning, adaptability, and student motivation. The introduction of flipped classroom models, blended learning, and SPOC-based designs in courses such as piano, mathematics, and installation engineering significantly boosted student engagement, participation, and satisfaction [15][29][33]. These environments

facilitated greater student agency and ownership of their learning—qualities essential for lifelong learning and adaptability in complex work environments.

Additionally, creativity and innovation development emerged as a central theme. Students involved in AI-enhanced OBE models showed significant improvements in creative thinking and practical skills, suggesting that OBE can foster higher-order thinking when paired with emerging technologies [16][31]. Another study that integrated Five-Color Psychology into engineering curriculum reforms observed growth in independent thinking and sustainability awareness, further supporting the positive impact of learner-centered OBE practices [23].

On the institutional level, OBE positively influenced teaching quality and faculty readiness. Faculty who engaged with informatization teaching models or implemented OBE frameworks demonstrated stronger engagement and improved instructional quality [7][9]. Studies on teacher attitudes also indicated a positive outlook toward OBE implementation, irrespective of biodemographic factors such as age or gender, suggesting that OBE has broad applicability and acceptance among educators [21].

One of the most notable findings is the alignment between student competencies and workforce demands. Through modular curriculum designs, AI-based assessments, and employability-focused course outcomes, institutions successfully bridged the gap between education and industry, enhancing graduates' relevance and preparedness for the workforce [28][29][34]. Tools like the INTI OBE Tool (IOBET) further supported individualized progress tracking and continuous instructional improvement [34].

The studies in Table 3 confirm that Outcome-Based Education not only improves measurable academic performance but also fosters the development of soft skills, self-directed learning, and professional readiness. By enabling institutions to align learning objectives with societal needs and empowering students to take ownership of their learning, OBE emerges as a transformative force in modern education. However, further research is necessary to assess the long-term sustainability of these impacts and to explore how OBE outcomes may differ across disciplines, regions, and learner demographics [6][16][19][28][34][35].

Challenges and Gaps in Current Research on Outcome-based Education

Tabel 4. Challenges and Gaps in Current Research on Outcome-based Education

No	Research Title	Subject	Result
1	A Practical Study of Computer-Assisted College English Intelligent Teaching Course Based on OBE Theory [6].	Students	Highlighted the need for more empirical research on the integration of computer-assisted learning with OBE to assess its long-term impact on student performance.
2	Research on the enhancement of informatization literacy of design practice teaching faculty in applied colleges and universities based on OBE model in the context of artificial intelligence [7].	University Students	Gaps include varying informatization levels and insufficient resources in some institutions

No	Research Title	Subject	Result
3	Research on the Optimization Pathways of University Education and Teaching Reform based on OBE Concepts by Jingjing Huang [8].	University Students	Challenges include developing better evaluation systems and linking curriculum design to real-world needs.
4	A Study on the Strategy to Improve the Informatization Teaching Ability of Teachers in Higher Education Institutions Based on OBE Concept [9].	Teachers	The overall mean value of policy training was 3.55, lower than the mean values for teacher and school factors, indicating a gap in this area.
5	New model of college physical education teaching based on the algorithm and data structure of flipped classroom and OBE [10].	College Students	Long-term effects of the new teaching model need further verification.
6	Reform and Exploration of Multidimensional Aviation Service Teaching Mode Based on OBE [11].	Students	Highlighting gaps such as the lack of comprehensive service thinking development, which the new OBE-based model aims to address.
7	A Study on the Innovation of University English Teaching Mode by Integrating OBE and Mixed Reality Technology [12].	Students	D1 Teaching Reflection and D4 Teaching Sustainability received low ratings, below 4, highlighting areas for improvement in the teaching model.
8	Construction of a Multidimensional Assessment Model of Modern Apprenticeship Cultivation Effect and Creation of "Embedded" Dual-Teacher Teaching Teams under the OBE Concept [13].	Vocational College Students	Gaps exist in integrating innovation and practical skills within the OBE framework.
9	Innovative integration of the "W + Flipped Classroom" and "B + BOPPPS" teaching models for enhanced learning outcomes [14].	University Students	Limited improvements in critical thinking and called for ongoing curriculum optimization
10	Research on the Hybrid Teaching Model of Piano in Normal Universities Based on "OBE + Politics Integrated Courses [15].	Student	Gaps like unclear goals, limited methods, and insufficient integration of ideological education in current teaching models.
11	Application of Outcome-Based Education Instructional Theory Based on Artificial Intelligence in the Design and Practice of Research Curriculum [16].	Students	Challenges in assessing student achievements and integrating AI-based models.
12	Analysis of Factors Influencing the Quality of Teaching Mathematics and Applied Mathematics under the Orientation of OBE Philosophy [17].	Student	The need for further research to refine the effectiveness of OBE in mathematics education and to address the insufficient focus on personalized learning outcomes.
13	Developing a BOPPPS (Bridge-in, Objectives, Pre-assessment, Participatory Learning, Post-assessment and Summary) model combined with the OBE (Outcome Based Education) concept to improve the teaching outcomes of higher education [18].	Undergraduate Students	Lacks clear implementation strategies for OBE and integrated models combining OBE with active learning methods like BOPPPS.
14	Multi-method Integrated Experimental Teaching Reform of a Programming Course Based on the OBE-CDIO Model Under the Background of Engineering Education [19].	Students	Challenges in integration, including inadequate online-offline teaching integration and a lack of industry positions for students, limiting the model's potential.
15	Innovative Reform of Blended Teaching in Statistics Practice Class of Economics and Management under OBE Concept Orientation [20].	University Students	More research to enhance personalized learning and teaching methods using algorithms.

No	Research Title	Subject	Result
16	Inclination of Teachers to Implement Outcome-Based Education in English Courses in Saudi Universities [21].	English Language Teachers	Teachers face in transitioning to outcome-based methods and the need for further research.
17	Analysis and Countermeasures of Cultivating Independent Learning Ability in Colleges Teaching English Based on OBE Theory [22].	College Students	The questionnaire overlooks the diversity of college students and is too simplistic to reflect their varied perspectives.
18	Engineering Curriculum Reform Based on Outcome-Based Education and Five-Color Psychology Theory [23].	Students	Challenges in integrating technology and adapting it to various disciplines, stressing the need for improvements in design and evaluation.
19	Study on the construction and practice of blended teaching mode of emergency first aid specialty based on OBE concept [24].	Undergraduate Students	The study highlighted the lack of research on OBE's effectiveness in emergency first aid education and the integration of theory with clinical practice.
20	Factors affecting student readiness towards OBE implementation in engineering education Evidence from a developing country [25].	Engineering Students	The lack of institutional support and long-term evaluation hinders OBE implementation.
21	Research and practice of the BOPPPS teaching model based on the OBE concept in clinical basic laboratory experiment teaching [26].	Medical Laboratory Students	Gaps remain in technology and curriculum design.
22	Construction and practice of training system for dance professionals based on OBE teaching model combined with Kinect motion capture technology [27].	Professional Dancers	A key challenge is developing core values and innovation abilities in dance students, with gaps in the current system.
23	Research on a Sustainable Teaching Model Based on the OBE Concept and the TSEM Framework [28].	Undergraduate Students	Lack of sustainable teaching models combining OBE and TSEM, and stress the need for studies on their long-term impact on student competencies in diverse contexts.
24	OBE Concept for New Training Mode of Electronic Information Science and Technology Professionals under Big Data Analysis [29].	University Students	The lack of integration between curriculum and industry requirements.
25	Outcome Based Education (OBE) Defining the Process and Practice for Engineering Education [30].	Engineering Students	Faculty resistance and concerns about restricting creative learning are key challenges.
26	Study on OBE Teaching Concept in the Context of Deep Learning for the Construction of University Mathematics Microcourses [31].	University Students	Gaps in integrating AI with teaching strategies to better address diverse learning needs and enhance educational outcomes.
27	Construction of OBE Concept Autonomous Learning Mode in University Teaching Based on the Internet [32].	University students	Self-regulation aspects, like self-monitoring and time management, remain challenging and require further development.
28	Construction and application of SPOC-based flipped classroom teaching mode in Installation Engineering Cost curriculum based on OBE concept [33].	Student	Challenges include ineffective online learning evaluations and the need for better assessment methods.
29	Outcome-based personalised learning measurement tool for engineering education	Student	The lack of personalized OBE measurement tools in existing research, highlighting the need for more specific tracking of individual learning

No	Research Title	Subject	Result
	at INTI International University - INTI OBE tool (IOBET) [34].		achievements to improve educational quality.
30	Evaluating the Role of the Communication Skills of Engineering Students on Employability According to the OBE Theory [35].	Engineering Students	Particularly in applying OBE theory to develop communication skills in professional contexts and considering the employer's perspective.

Analysis of Table 4 reveals a series of recurring challenges and research gaps associated with the implementation and evaluation of Outcome-Based Education (OBE) across various academic disciplines. Although OBE continues to gain traction globally as a framework for aligning learning outcomes with curriculum design, several studies point to critical areas where theoretical frameworks, implementation strategies, and empirical validation remain underdeveloped [6][7][8].

One key area of concern involves the lack of longitudinal and empirical research to evaluate the long-term effects of OBE integration. For example, while the use of the Rain Classroom platform in English teaching has shown short-term improvements, more research is needed to understand its sustained impact on student performance and engagement over time [6]. Similarly, the long-term effectiveness of blended teaching models, particularly in physical education and emergency first aid contexts, requires further empirical assessment to validate the durability of the observed improvements [10][24].

Another prominent gap lies in the insufficient integration between curriculum and real-world or industry demands. Several studies highlight disconnects between academic content and practical skills, particularly in applied and vocational education. For instance, studies in aviation services and electronic information science education emphasize the need to better align curriculum design with evolving industry requirements and professional expectations [11][29]. Moreover, many institutions still struggle to incorporate innovative and entrepreneurial components into OBE curricula, limiting students' creative and market-oriented competencies [13][27].

Implementation issues also surface in studies focusing on pedagogical innovation and faculty readiness. Teachers often face challenges in transitioning to OBE-aligned methodologies, especially when institutional support or policy training is insufficient [9][21]. Faculty resistance is a persistent concern in engineering education, with some educators expressing skepticism regarding the restrictive nature of outcome-driven models and their potential to inhibit creative learning [30]. Additionally, the integration of active learning frameworks such as BOPPPS into OBE lacks clear operational strategies, limiting their practical effectiveness [18].

Several studies also underscore methodological and assessment-related gaps. For example, AI-based instructional design in mathematics and research curricula faces difficulties in

accurately assessing diverse learning outcomes and adapting teaching strategies to student variability [16][31]. Even technologically enhanced approaches, such as the use of personalized OBE tools like IOBET, reveal the scarcity of precise, individual-level measurement tools that can track competency progression over time [34]. Other studies highlight the need for more effective online learning evaluation methods and performance-based assessments, especially in flipped classroom and SPOC-based environments [33].

Student-related factors, such as readiness, self-regulation, and diverse learning needs, also remain underexplored. For instance, several studies report that instruments used to measure student adaptability or engagement are overly simplistic or fail to account for demographic variation and learner heterogeneity [22][25][32]. Self-monitoring and time management—essential for autonomous learning—are also reported as weak points in OBE-based online learning models [32].

Finally, there is an evident gap in sustainability research regarding OBE's long-term pedagogical and institutional impact. Few studies evaluate how sustainable teaching models—especially those integrating additional frameworks like TSEM—affect student competencies over time or in cross-cultural settings [28]. Moreover, psychological and socio-emotional competencies, such as the development of core values, motivation, and creativity, are often mentioned but rarely assessed in detail, pointing to an urgent need for more holistic evaluation models [23][27].

The findings from Table 4 indicate that while OBE holds significant promise, its current application and study remain uneven. Future research should aim to address the theoretical, practical, and empirical gaps by developing more nuanced implementation strategies, robust evaluation mechanisms, and adaptive instructional models. Prioritizing interdisciplinary integration, sustainable practice, and learner diversity will be essential to elevate OBE from a technical framework to a transformative pedagogical paradigm [6][13][16][23][28][30][34].

Conclusion

This study provides an in-depth review of OBE, an evolving educational paradigm that remains relevant in addressing the challenges of the 21st century. By systematically analyzing 38 scholarly articles, the research successfully identifies various pedagogical innovations, implementation strategies, and the impacts resulting from the application of OBE in higher education contexts globally.

OBE innovations are characterized by the integration of advanced technologies, such as artificial intelligence, personalized learning algorithms, flipped classrooms, and blended learning models. These approaches foster the development of more adaptable curricula, data-driven learning assessments, and the creation of individualized learning pathways that are better

aligned with students' needs. Beyond focusing on cognitive learning outcomes, these innovations also promote the development of practical skills and soft skills, including critical thinking, communication, and creativity.

The implementation strategies identified in the study reflect a wide range of approaches across disciplines and institutions. Models such as BOPPPS, CDIO, and the use of digital platforms demonstrate that OBE is not only a conceptual framework but also a practical foundation for designing competency-based learning. The success of OBE implementation relies heavily on institutional readiness, faculty capacity, and the presence of ongoing evaluation mechanisms. The findings indicate that integrating OBE into curriculum structures, evaluation models, and instructional planning can enhance student participation and academic performance.

Regarding the impacts, OBE has proven to significantly contribute to improvements in learning outcomes, student satisfaction, graduate employability, and faculty engagement. Additionally, the adoption of OBE helps guide learning towards measurable and meaningful achievements, while strengthening the connection between education and labor market needs. Several studies also note improvements in students' independent learning abilities and motivation as a result of OBE's focus on active student involvement.

However, the study also highlights various challenges and gaps in OBE implementation, such as faculty resistance to change, limitations in professional training, uneven integration of technology, and the lack of long-term evaluation. Some of the evaluation instruments used are still superficial and fail to capture the diverse backgrounds and learning needs of students comprehensively.

OBE holds significant potential to revolutionize higher education if applied systematically and contextually. Moving forward, there is a need for the development of sustainable implementation models, longitudinal studies on long-term effectiveness, and the use of more inclusive and personalized technologies. Cross-cultural and interdisciplinary research is also essential to deepen understanding of OBE's flexibility and adaptability across various global educational systems.

Acknowledgment

I would like to express my sincere gratitude to Dr. Endang Hariningsih for her valuable contribution in reviewing and correcting my article. Her insights and guidance greatly improved the quality of my work. I also wish to thank the developers of the Watase Uake software, whose tool significantly facilitated my research process in conducting the Systematic Literature Review.

Conflict of Interest

The authors declare that there is no conflict of interest.

Bibliography

- [1] G. R. Sinha, N. Gunawardhana, and C.-P. Fan, *Outcome-Based Education Toward Achieving Sustainable Goals in Higher Education*. 2022. doi: 10.1002/9781119852858.ch3.
- [2] G. R. Sinha, *Assessment Tools for Mapping Learning Outcomes With Learning Objectives*. 2020. doi: 10.4018/978-1-7998-4784-7.
- [3] S. Mehta, Y. Shah, and M. Nandula, "A case study: Innovative teaching-learning practices towards obe," *Journal of Engineering Education Transformations*, vol. 35, no. Special Issue, pp. 44 – 48, 2021, doi: 10.16920/jeet/2021/v35i0/167020.
- [4] K. Sudheer, V. V. N. Sujit, N. V. G. Prasad, and K. Ravichand, "A novel method of learning outcome assessment in outcome based education," in *Proceedings - 2016 IEEE 4th International Conference on MOOCs, Innovation and Technology in Education, MITE 2016*, 2017, pp. 328 – 331. doi: 10.1109/MITE.2016.63.
- [5] P. Solomon and R. Khandelwal, *Outcome-based education in business schools: The adoption of a progressive cult*. 2020. doi: 10.4018/978-1-7998-4784-7.ch009.
- [6] B. Chen, "A Practical Study of Computer-Assisted College English Intelligent Teaching Course Based on OBE Theory," *Applied Mathematics and Nonlinear Sciences*, vol. 9, no. 1, Jan. 2024, doi: 10.2478/amns.2023.2.01624.
- [7] D. Gong and P. Xiao, "Research on the enhancement of informatization literacy of design practice teaching faculty in applied colleges and universities based on OBE model in the context of artificial intelligence," *Applied Mathematics and Nonlinear Sciences*, vol. 9, no. 1, Jan. 2024, doi: 10.2478/amns-2024-0971.
- [8] J. Huang, "Research on the Optimization Pathways of University Education and Teaching Reform based on OBE Concepts," *Applied Mathematics and Nonlinear Sciences*, vol. 9, no. 1, Jan. 2024, doi: 10.2478/amns.2023.2.00675.
- [9] M. Jia, "A study on the strategy to improve the informatization teaching ability of teachers in higher education institutions based on OBE concept," *Applied Mathematics and Nonlinear Sciences*, vol. 9, no. 1, Jan. 2024, doi: 10.2478/amns.2023.2.00905.
- [10] Y. Kong, W. Wang, and B. Rajabov, "New model of college physical education teaching based on the algorithm and data structure of flipped classroom and OBE," *Heliyon*, vol. 10, no. 11, Jun. 2024, doi: 10.1016/j.heliyon.2024.e31368.
- [11] Y. Li, "Reform and Exploration of Multidimensional Aviation Service Teaching Mode Based on OBE," *Applied Mathematics and Nonlinear Sciences*, vol. 9, no. 1, Jan. 2024, doi: 10.2478/amns-2024-2338.
- [12] Y. Liang, "A Study on the Innovation of University English Teaching Mode by Integrating OBE and Mixed Reality Technology," *Applied Mathematics and Nonlinear Sciences*, vol. 9, no. 1, Jan. 2024, doi: 10.2478/amns-2024-2671.
- [13] X. Mo, "Construction of a Multidimensional Assessment Model of Modern Apprenticeship Cultivation Effect and Creation of 'Embedded' Dual-Teacher Teaching Teams under the OBE Concept," *Applied Mathematics and Nonlinear Sciences*, vol. 9, no. 1, Jan. 2024, doi: 10.2478/amns-2024-2313.
- [14] L. Siqiang *et al.*, "Innovative integration of the 'W + Flipped Classroom' and 'B + BOPPPS' teaching models for enhanced learning outcomes," *BMC Med Educ*, vol. 24, no. 1, p. 1050, Dec. 2024, doi: 10.1186/s12909-024-06034-5.
- [15] H. Wang, "Research on the Hybrid Teaching Model of Piano in Normal Universities Based on 'OBE + Politics Integrated Courses,'" *Applied Mathematics and Nonlinear Sciences*, vol. 9, no. 1, Jan. 2024, doi: 10.2478/amns-2024-2641.
- [16] X. Wang and L. Yang, "Application of Outcome-Based Education Instructional Theory Based on Artificial Intelligence in the Design and Practice of Research Curriculum," *International Journal of e-Collaboration*, vol. 20, no. 1, 2024, doi: 10.4018/IJeC.356498.
- [17] J. Wei and T. Zhang, "Analysis of Factors Influencing the Quality of Teaching Mathematics and Applied Mathematics under the Orientation of OBE Philosophy," *Applied Mathematics and Nonlinear Sciences*, vol. 9, no. 1, Jan. 2024, doi: 10.2478/amns-2024-1383.
- [18] Z. Xu *et al.*, "Developing a BOPPPS (Bridge-in, Objectives, Pre-assessment, Participatory Learning, Post-assessment and Summary) model combined with the OBE (Outcome Based Education) concept to improve the teaching outcomes of higher education," *Humanit Soc Sci Commun*, vol. 11, no. 1, Dec. 2024, doi: 10.1057/s41599-024-03519-y.

- [19] X. Yuan, J. Wan, D. An, J. Lu, and P. Yuan, "Multi-method integrated experimental teaching reform of a programming course based on the OBE-CDIO model under the background of engineering education," *Sci Rep*, vol. 14, no. 1, Dec. 2024, doi: 10.1038/s41598-024-67667-6.
- [20] H. Zhang, "Innovative Reform of Blended Teaching in Statistics Practice Class of Economics and Management under OBE Concept Orientation," *Applied Mathematics and Nonlinear Sciences*, vol. 9, no. 1, Jan. 2024, doi: 10.2478/amns-2024-1517.
- [21] M. A. B. Al-Saqqaf, "Inclination of Teachers to Implement Outcome-Based Education in English Courses in Saudi Universities," *World Journal of English Language*, vol. 13, no. 8, pp. 168–181, 2023, doi: 10.5430/wjel.v13n8p168.
- [22] Y. Feng, "Analysis and countermeasures of cultivating independent learning ability in colleges teaching English based on OBE theory," *Applied Mathematics and Nonlinear Sciences*, vol. 8, no. 2, pp. 571–580, Jul. 2023, doi: 10.2478/amns.2021.2.00298.
- [23] A. Hu, X. Mao, C. Fu, M. Wu, and S. Zhou, "Engineering Curriculum Reform Based on Outcome-Based Education and Five-Color Psychology Theory," *Sustainability (Switzerland)*, vol. 15, no. 11, Jun. 2023, doi: 10.3390/su15118915.
- [24] Y. Huang, H. Guo, and Y. Li, "Study on the construction and practice of blended teaching mode of emergency first aid specialty based on OBE concept," *Medicine (United States)*, vol. 102, no. 28, p. E34252, Jul. 2023, doi: 10.1097/MD.00000000000034252.
- [25] M. S. H. Khan, N. Salele, M. Hasan, and B. O. Abdou, "Factors affecting student readiness towards OBE implementation in engineering education: Evidence from a developing country," *Heliyon*, vol. 9, no. 10, Oct. 2023, doi: 10.1016/j.heliyon.2023.e20905.
- [26] P. Li, X. Lan, L. Ren, X. Xie, H. Xie, and S. Liu, "Research and practice of the BOPPPS teaching model based on the OBE concept in clinical basic laboratory experiment teaching," *BMC Med Educ*, vol. 23, no. 1, Dec. 2023, doi: 10.1186/s12909-023-04822-z.
- [27] B. Wang, "Construction and practice of training system for dance professionals based on OBE teaching model combined with Kinect motion capture technology," *Applied Mathematics and Nonlinear Sciences*, Jun. 2023, doi: 10.2478/amns.2023.1.00158.
- [28] W. Zheng, S. Wen, B. Lian, and Y. Nie, "Research on a Sustainable Teaching Model Based on the OBE Concept and the TSEM Framework," *Sustainability (Switzerland)*, vol. 15, no. 7, Apr. 2023, doi: 10.3390/su15075656.
- [29] J. Liang, "'oBE' Concept for New Training Mode of Electronic Information Science and Technology Professionals under Big Data Analysis," *Comput Intell Neurosci*, vol. 2022, 2022, doi: 10.1155/2022/8075708.
- [30] M. M. Mahbubul Syeed, A. S. M. Shihavuddin, M. F. Uddin, M. Hasan, and R. H. Khan, "Outcome Based Education (OBE): Defining the Process and Practice for Engineering Education," *IEEE Access*, vol. 10, pp. 119170–119192, 2022, doi: 10.1109/ACCESS.2022.3219477.
- [31] Y. Qiao and H. Fu, "Study on OBE Teaching Concept in the Context of Deep Learning for the Construction of University Mathematics Microcourses," *Comput Intell Neurosci*, vol. 2022, 2022, doi: 10.1155/2022/6860842.
- [32] F. Yang and J. Fan, "Construction of OBE Concept Autonomous Learning Mode in University Teaching Based on the Internet," *Journal of Cases on Information Technology*, vol. 24, no. 5, Feb. 2022, doi: 10.4018/JCIT.295250.
- [33] L. Zhang, Y. Xuan, and H. Zhang, "Construction and application of SPOC-based flipped classroom teaching mode in Installation Engineering Cost curriculum based on OBE concept," *Computer Applications in Engineering Education*, vol. 28, no. 6, pp. 1503–1519, Nov. 2020, doi: 10.1002/cae.22320.
- [34] E. Malini, T. J. Deepak, P. Kannan, and P. Venishri, "Outcome-based personalised learning measurement tool for engineering education at INTI International University - INTI OBE tool (IOBET)," *Int J Contin Eng Educ Life Long Learn*, vol. 27, no. 4, pp. 287–302, 2017, doi: 10.1504/IJCEELL.2017.087138.
- [35] Y. Wu, L. Xu, and S. P. Philbin, "Evaluating the Role of the Communication Skills of Engineering Students on Employability According to the Outcome-Based Education (OBE) Theory," *Sustainability (Switzerland)*, vol. 15, no. 12, Jun. 2023, doi: 10.3390/su15129711.

Authors



Edwin is a lecturer at Sekolah Tinggi Teologi Kingdom, Indonesia, specializing in Christian Religious Education and research methodology. His scholarly work focuses on the intersection of theology, educational practice, and contemporary pedagogical innovations. He has presented and published at both national and international conferences, with recent studies addressing topics such as anti-corruption education in Indonesia, outcome-based education in the 21st century, and connective learning in Christian education. His research demonstrates a strong commitment to integrating theological values with evidence-based educational practices. (email: edwin.sttkingdom@gmail.com).



Vonny A. Susanta is a lecturer at Sekolah Tinggi Teologi Kingdom, Indonesia, with expertise in Christian Religious Education and counseling. Her academic work focuses on the integration of biblical principles into counseling practices and educational settings. She has published several articles, including studies on spiritual growth in Christian communities, coping strategies in marriage from a biblical perspective, and the role of Christian teachers in guidance and counseling services. Her research reflects a strong commitment to promoting holistic spiritual development and practical applications of Christian education. (email: vas.sttkingdom@gmail.com).