Talent Cultivation of 'Combat-Study-Research' Type for Cybersecurity and Law Enforcement Major Based on OBE Concept

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Abstract. This paper explores an OBE-driven “Battle, Study, Research” (BSR) model for cultivating interdisciplinary cybersecurity and law enforcement professionals. Emphasizing practical skills, academic inquiry, and real-world problem-solving, the model integrates BOPPPS pedagogy to enhance instructional effectiveness. Curriculum innovation, interdisciplinary learning, and outcome-based assessment are central to preparing students for complex digital threats and legal challenges. The study contributes to professional education reform by aligning learning outcomes with industry needs, fostering student-centered, experiential learning environments.

Keywords: Combat, study, research, OBE, talent cultivation.

1. Introduction

The rapid advancement of digital technologies has transformed commerce, security, and law enforcement, creating an urgent demand for skilled professionals at the intersection of online business, cybersecurity, and legal enforcement. Traditional educational approaches, which often emphasize theory over practice, are increasingly inadequate to address contemporary cyber threats. Consequently, there is a pressing need to reimagine talent cultivation strategies, aligning them with modern pedagogical philosophies and industry requirements.

The "Combat-Study-Research" model, rooted in the OBE philosophy, offers an innovative framework. OBE emphasizes clearly defined educational outcomes, guiding curriculum design and teaching methods toward practical competence. Integrating this with the "Combat-Study-Research" model combines experiential learning, academic inquiry, and applied skills training, directly aligning educational objectives with workforce needs. This field demands a multidisciplinary skill set encompassing technical proficiency, legal literacy, and strategic problem-solving, necessitating curriculum innovation that prioritizes interdisciplinary learning across computer science, law, and business disciplines.

Practical skills acquisition is central to the model, achieved through project-based learning, simulated scenarios, and internships. The BOPPPS teaching methodology enhances instructional effectiveness by ensuring lessons are goal-oriented, engaging, and continuously evaluated. This approach is particularly relevant in online business education, where technological evolution requires agile training programs. By simulating real-world environments, students are better prepared for professional roles in various organizations. Implementing the OBE-based model motivates learners, encourages critical thinking, and ensures graduates are equipped to meet the demands of the evolving digital economy. This paper explores the design, implementation, and effectiveness of this integrated educational approach.

2. Research Framework and Methodology

2.1. Research Design

This study adopts a mixed-methods design to investigate the effectiveness of the "Combat-Study-Research" model within an OBE framework. It combines qualitative and quantitative strategies to provide a holistic understanding of curriculum reforms, pedagogical practices, and student outcomes.

Quantitative data collection focuses on assessing student performance, skill acquisition, and satisfaction through surveys. Qualitative data are gathered via interviews, focus groups, and classroom observations to capture the perceptions of educators, students, and industry stakeholders regarding the model's implementation and challenges.

The research framework incorporates several key elements. A case study approach is used within selected institutions that have adopted the model, enabling in-depth analysis of curriculum design and teaching strategies. A quasi-experimental design compares outcomes between experimental groups undergoing the new curriculum and control groups following traditional methods. Furthermore, a participatory action research component allows educators and students to collaboratively reflect on and refine instructional practices, fostering continuous improvement aligned with OBE outcomes. The design emphasizes iterative cycles of planning, implementation, evaluation, and reflection, ensuring the model remains adaptive to feedback. It integrates the BOPPPS teaching framework to systematically articulate learning objectives, incorporate participatory activities, and conduct assessments, ensuring the research findings are robust and aligned with contemporary educational theories and industry needs.

2.2. Research Content and Procedures

The research aims to thoroughly investigate how the integration of OBE and the BOPPPS model enhances talent development. The research content involves an in-depth analysis of the theoretical foundations of OBE and BOPPPS, an examination of current curriculum structures and assessment models, and the design and implementation of an optimized, interdisciplinary curriculum framework that emphasizes practical skills acquisition.

The research procedures are structured into sequential phases:

●Literature Review and Theoretical Exploration: Systematically reviewing relevant literature on OBE, BOPPPS, interdisciplinary education, and professional skills training to establish a theoretical foundation and identify best practices.

●Needs Analysis and Stakeholder Engagement: Conducting surveys, interviews, and focus groups with educators, industry professionals, and students to gather insights on educational gaps and industry demands.

●Curriculum Development and Pilot Implementation: Designing an integrated curriculum featuring modules on cybersecurity, legal enforcement, and practical skills, utilizing the BOPPPS teaching cycle. This phase includes educator training and pilot delivery over an academic term.

●Data Collection and Assessment: Employing multiple evaluation methods, including quantitative surveys, qualitative interviews, classroom observations, and performance assessments (practical exams, project reports).

●Data Analysis and Refinement: Analyzing collected data using statistical tools and thematic analysis to assess effectiveness and make necessary adjustments to the curriculum and teaching methods.

●Dissemination and Scalability: Documenting the validated framework, teaching approaches, and results to promote broader adoption among educational institutions and industry partners.

This evidence-based process ensures a systematic investigation and provides practical guidance for curriculum reform.

2.3. BOPPPS Teaching Methodology in Professional Courses

The BOPPPS model (Bridge, Objectives, Pre-assessment, Participatory Learning, Post-assessment, Summary) is effectively integrated into professional courses to promote active learning and practical skill development.

●Bridge (B): The initial phase connects new content to students' prior knowledge and real-world contexts, such as presenting recent cybersecurity incidents or cybercrime cases to spark interest and establish relevance.

●Objectives (O): Learning outcomes are explicitly articulated, aligning with industry standards and OBE requirements. These may include technical skills like intrusion detection or broader competencies like critical thinking and ethical judgment.

●Pre-assessment (P): Formative assessments, like quizzes or discussions, gauge students' initial understanding and identify misconceptions, allowing instructors to tailor their teaching strategies accordingly.

●Participatory Learning (P): This core phase engages students in active, collaborative tasks such as simulation exercises, vulnerability assessments, mock investigations, and team projects. This applies theoretical knowledge to realistic problems.

●Post-assessment (P): Summative assessments, including practical exams, project presentations, and case analyses, evaluate students' mastery of the learning objectives and identify areas for improvement.

●Summary (S): The concluding phase consolidates key concepts, reinforces skills, and prompts reflection through discussions, journals, or action plans, fostering deeper understanding and lifelong learning.

The implementation of BOPPPS aligns instruction with outcome-based standards, emphasizes experiential learning, and systematically ensures the achievement of targeted competencies, effectively bridging theory and practice within the "Combat-Study-Research" model.

2.4. Data Collection and Analysis Methods

A multifaceted approach to data collection and analysis ensures a rigorous evaluation of the model's impact.

●Quantitative Data Collection: Structured surveys and questionnaires using Likert-scale and multiple-choice items are administered to students, instructors, and industry stakeholders to quantify perceptions of curriculum relevance, skill acquisition, and satisfaction. These instruments are piloted to ensure reliability and validity.

●Qualitative Data Collection: Semi-structured interviews, focus group discussions, and open-ended survey responses capture in-depth insights into participants' experiences, perceptions, and suggestions regarding the model's implementation.

●Classroom Observations: Systematic observations using standardized checklists assess instructional fidelity, student engagement, and the integration of practical activities.

Content Analysis: Curriculum documents, teaching plans, and student project reports are analyzed to evaluate alignment with OBE outcomes.

●For data analysis, quantitative data is processed using statistical software (e.g., SPSS, R) for descriptive and inferential statistics (t-tests, ANOVA, regression). Qualitative data undergoes thematic analysis to identify recurring themes and patterns. Triangulation of data from different sources enhances the validity and reliability of the findings. Ethical standards, including informed consent and confidentiality, are strictly maintained throughout the research process.

3. Building the OBE-Driven “Battle, Study, Research” Talent Cultivation Model

This section operationalizes the BSR model through four integrated components: goal orientation, curriculum innovation, practical training, and interdisciplinary collaboration. Each aligns with OBE principles to produce industry-ready professionals.

3.1. Goal Orientation and Skill Cultivation

OBE defines clear graduate outcomes: technical proficiency, legal literacy, ethical judgment, and interdisciplinary problem-solving. Competency hierarchies guide progressive skill development. Practical tasks—labs, simulations, case studies—embed “learning by doing.” Soft skills like

communication and teamwork are nurtured through collaborative projects. Continuous assessment and feedback ensure alignment with evolving industry needs.

3.2. Curriculum System and Content Innovation

The curriculum is outcome-oriented, modular, and interdisciplinary. Core courses cover cybersecurity, cyber law, and digital forensics. Electives include AI, data analytics, and policy. BOPPPS structures delivery; simulations, virtual labs, and CTFs enhance realism. Industry-academic partnerships ensure content relevance. Digital tools and flipped classrooms support flexible, immersive learning. Project-based assessments foster cross-domain problem-solving.

3.3. Practical Teaching and Skills Training

Hands-on labs using Packet Tracer, Wireshark, and cyber ranges simulate real threats. CTF competitions and role-playing exercises develop technical and legal skills. Research projects on emerging threats cultivate innovation. BOPPPS ensures alignment between theory and practice. Interdisciplinary projects with law students simulate cybercrime investigations, fostering teamwork and holistic thinking.

3.4. Interdisciplinary Integration and Collaboration

Joint courses across computer science, law, and criminology use case-based learning. Cross-departmental teaching teams and shared labs foster collaboration. Research centers and internships with agencies provide real-world exposure. Interdisciplinary competitions and simulations enhance teamwork. Shared platforms and feedback loops support continuous improvement. A culture of mutual respect and incentives for cross-domain work sustain collaboration.

4. Conclusion

The OBE-driven BSR model offers a scalable, interdisciplinary framework for cultivating cybersecurity and law enforcement professionals. By integrating BOPPPS, real-world simulations, and continuous assessment, it ensures graduates are technically proficient, legally aware, and ethically grounded—ready to tackle evolving digital threats.

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