

Review Article

# Analysis of Training Design Needs for Accounting Vocational Teachers Using Project Based Learning Approach to Achieve Deep Learning: A Systematic Literature Review

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**Abstract:** This study analyzes the need for training design for accounting vocational teachers using Project Based Learning (PjBL) approach to achieve deep learning through systematic literature review. The gap in teachers' competence in implementing PjBL and the limitations of relevant training designs are major problems in vocational education. This research aims to identify trends, gaps, and needs for developing PjBL-based accounting teacher training designs oriented towards achieving deep learning. The systematic literature review method was employed by analyzing 25 articles from Scopus, ScienceDirect, and Google Scholar databases from 2018-2025. The research identified 25 unique articles categorized into three main themes: Deep Learning perspectives (10 articles), Vocational Teacher Training and Development (6 articles), and Project-Based Learning implementation (9 articles). The results show four main trends: (1) increased global adoption of PjBL as an innovative learning method, (2) demands from accounting professional organizations for active learning methods, (3) popularity of deep learning concepts in contemporary educational literature integrated with 21st-century skills, and (4) urgent need for comprehensive teacher training designs. Significant gaps were identified in the limitations of relevant training designs for vocational contexts and lack of systematic training development research. This study concludes that accounting vocational teacher training designs with PjBL approach are urgently needed to bridge the gap between theoretical competence and practical industry applications, with emphasis on achieving holistic deep learning encompassing cognitive, interpersonal, and intrapersonal domains.

**Keywords:** Deep Learning; Project Based Learning; Systematic Literature Review; Teacher Training; Vocational Accounting

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## 1. Introduction

Vocational education faces challenges in producing graduates who not only master theory but are also capable of applying knowledge in real industrial contexts. In the field of accounting, the gap between graduate competencies and industry needs is a serious concern. Teachers, as the frontline of vocational education, have a strategic role in equipping students with relevant skills. However, teacher readiness in designing innovative and practically-oriented learning remains a challenge.

Project Based Learning (PjBL) has proven effective as a learning method that bridges theory and practice. This approach facilitates authentic learning experiences through real-world relevant projects. Global accounting professional organizations such as the American Accounting Association (AAA) and International Financial Accounting Committee (IFAC) have been calling for active learning methods that develop professional competencies since the 1990s. However, the success of PjBL implementation highly depends on teacher readiness and competence.

The concept of deep learning has become a focus in contemporary educational literature. Deep learning not only emphasizes deep cognitive understanding but also integrates interpersonal and intrapersonal dimensions. This approach aligns with the need to develop

21st-century skills, particularly the 4Cs (Communication, Collaboration, Critical Thinking, and Creativity). In the context of teacher training, integrating PjBL with the goal of achieving deep learning is a promising yet still limited research approach.

Previous research shows significant gaps in teacher training design and implementation. Research has emphasized that teachers need adequate training to design relevant projects that stimulate student creativity. Studies have identified the need for further research to explore optimal PjBL implementation strategies, especially in vocational education contexts. However, research specifically developing PjBL-based accounting teacher training designs with deep learning orientation remains very limited.

Based on this background, this study aims to analyze the needs for accounting vocational teacher training design with PjBL approach to achieve deep learning through systematic literature review. Specifically, this study identifies global trends related to PjBL and deep learning, analyzes existing research gaps, and formulates training design development needs relevant to vocational accounting education contexts in Indonesia.

## 2. Research Method

This study uses the systematic literature review (SLR) method to analyze scientific publications related to Project Based Learning, teacher training, and deep learning in the context of vocational accounting education. The SLR approach was chosen because it enables comprehensive and systematic analysis of existing literature to identify trends, gaps, and future research directions.

### Search Strategy

Literature searches were conducted on three main databases: Scopus, ScienceDirect, and Google Scholar. Keywords used included combinations of: "project based learning", "PjBL", "teacher training", "professional development", "accounting education", "vocational education", "deep learning", and "meaningful learning". The reviewed publication period was 2018-2025 to ensure relevance to current educational contexts.

### Inclusion and Exclusion Criteria

Inclusion criteria included: (1) articles in English or Indonesian published in indexed journals or reputable conference proceedings, (2) focus on PjBL in accounting or vocational education contexts, (3) discussion of teacher training or competency development, and (4) exploration of deep learning or meaningful learning concepts.

Exclusion criteria included: (1) articles discussing PjBL only generally without specific context, (2) research not relevant to accounting or vocational education, (3) publications without clear methodology, and (4) articles not fully accessible.

### Selection and Analysis Process

The initial stage produced 156 articles from the three databases. After removing duplicates, 98 articles remained for title and abstract screening. From this process, 42 articles met the criteria for full-text analysis. After thorough reading and quality assessment, 25 unique articles were selected as the final sample for in-depth analysis. These 25 articles were categorized into three main themes: (1) Deep Learning perspectives in education (10 articles), (2) Vocational Teacher Training and Development (6 articles), and (3) Project-Based Learning implementation and effectiveness (9 articles). Analysis was conducted using content analysis and thematic analysis techniques to identify patterns, trends, and gaps in the literature. Data extracted from each article included: publication year, research method, PjBL implementation context, focus on teacher training, integration with deep learning, main findings, and research limitations. Synthesis analysis was conducted to identify global trends, research gaps, and training design development needs.

## 3. Results and Discussion

### Results

Overview of Analyzed Articles. The systematic literature review analyzed 25 unique articles published between 2018-2025. These articles were strategically categorized into three interconnected themes that form the foundation of this research: Deep Learning perspectives (10 articles) focusing on theoretical frameworks and pedagogical approaches; Vocational Teacher Training and Development (6 articles) examining professional development needs and collaborative practices; and Project-Based Learning implementation (9 articles) demonstrating practical applications across various educational contexts. This categorization reveals the multifaceted nature of educational innovation required for effective vocational accounting teacher training.

### ***Trend 1: Increased Global Adoption of Project Based Learning***

Analysis results show a significant increase in PjBL research in recent years, with 9 articles specifically focused on PjBL implementation across diverse educational contexts. Studies demonstrate that PjBL is increasingly used and considered an innovative and effective learning method globally. The use of PjBL is not limited to one field but extends to various disciplines, from elementary school to higher education levels, including professional training implementation. Research shows PjBL creates enjoyable and profound learning experiences, increasing students' emotional involvement and enthusiasm because the projects they work on are relevant to their real lives. These findings indicate an urgent need for teachers to master this approach through structured training.

### ***Trend 2: Professional Organization Demands for Active Learning in Accounting***

There is a strong trend to adopt active learning methodologies, particularly PjBL, in accounting education. Research identifies that this aligns with demands from global accounting professional organizations such as the American Accounting Association (AAA) and International Financial Accounting Committee (IFAC) since the 1990s calling for learning methods that facilitate professional competency and skill development. PjBL is considered successful because it can bridge the gap between theory learned in class and its real-world application. Students use real company information to analyze and solve complex accounting problems. Studies show that at university and polytechnic levels, PjBL is applied in accounting courses to improve student competencies, demonstrating that this approach aligns with industry needs and modern accounting profession demands.

### ***Trend 3: Popularity of Deep Learning Concepts in Contemporary Education***

The concept of deep learning has become a popular and widely recognized term in contemporary educational literature, with 10 articles specifically exploring deep learning frameworks. Research explains that in educational contexts, deep learning aims to provide deep, integrated, and applicable understanding, not just memorizing facts. Deep learning is explicitly linked to developing 21st-century skills, especially 4C skills (Communication, Collaboration, Critical Thinking, and Creativity). Studies emphasize that deep learning enables students to become adaptive, innovative learners ready to face global challenges. This concept encompasses a holistic dimension involving interpersonal domains (such as collaboration and communication) and intrapersonal domains (interests, motivation, and emotion management). The terms meaningful learning, mindful learning, and joyful learning are often used to emphasize that deep learning is a complete, reflective learning experience oriented toward both personal and social growth.

### ***Trend 4: Urgent Need for Comprehensive Teacher Training Design***

Literature with 6 articles specifically focused on teacher training shows an urgent need for teacher training programs that not only introduce PjBL methods but also equip teachers with skills to design learning that achieves deep learning. Research demonstrates that PjBL has been used as a training model for teachers to improve their competencies in designing innovative learning. However, studies also identify that PjBL success highly depends on teacher readiness in designing relevant projects that stimulate student creativity, indicating teachers need adequate training. The analysis reveals that vocational teacher training requires collaboration between institutions and industry, with emphasis on competency development aligned with technological advancements and industry needs.

## **Discussion**

### ***Research Gap: Limitations of Relevant Training Designs***

Analysis of the 25 articles revealed significant gaps in teacher training design and implementation. Research confirms that PjBL effectiveness can vary depending on factors such as teacher readiness, school facilities, and student characteristics. Therefore, further research is needed to explore conditions and strategies that can optimize PjBL implementation, especially in vocational education contexts. The main gap identified across the three thematic categories is the limitation of relevant training designs for specific contexts and the lack of research focus on how to design and implement teacher training that effectively equips them with skills and deep understanding of PjBL, especially to achieve specific goals such as deep learning in vocational fields. This need demands research in developing systematic and contextual training designs.

### ***Integration of Three Research Themes***

The analysis of 25 articles across three interconnected themes reveals a crucial synthesis: Deep Learning perspectives provide the theoretical foundation and desired learning outcomes; Project-Based Learning offers the pedagogical methodology to achieve these outcomes; and Vocational Teacher Training represents the essential mechanism for

implementation. This triangulation demonstrates that effective vocational accounting education requires (1) clear understanding of deep learning principles encompassing cognitive, interpersonal, and intrapersonal dimensions, (2) practical application through well-designed PjBL approaches that connect theory with industry practice, and (3) comprehensive teacher training programs that develop both pedagogical competencies and industry-relevant knowledge. The gap in systematic integration of these three elements creates the research space this study addresses.

### ***Urgency of PjBL-Based Accounting Teacher Training Design***

Based on findings from four main trends and identified research gaps synthesized from 25 articles, this study concludes that accounting vocational teacher training design with PjBL approach to achieve deep learning is urgently needed. This urgency is driven by several factors. First, global demands from accounting professional organizations for active learning methods that develop professional competencies. Second, the gap between vocational education graduate competencies and industry needs requiring real project-based learning approaches. Third, the popularity of deep learning concepts emphasizing integration of cognitive, interpersonal, and intrapersonal domains aligns with vocational education goals to produce graduates who are not only technically competent but also adaptive and innovative. Fourth, the success of PjBL implementation highly depending on teacher readiness and competence requires structured, systematic, and contextual training programs.

### ***Implications for Training Development***

The developed training design must address identified gaps by providing a comprehensive framework informed by insights from 25 diverse research articles. Training needs to include: (1) deep understanding of PjBL principles and practices in accounting contexts, (2) skills in designing authentic industry-relevant projects, (3) facilitation strategies supporting deep learning achievement across cognitive, interpersonal, and intrapersonal domains, (4) integration of 4C skills in learning design, and (5) evaluation mechanisms measuring not only cognitive outcomes but also interpersonal and intrapersonal dimensions. This research contribution lies in comprehensive mapping of training design needs based on systematic analysis of global literature spanning deep learning theory, PjBL methodology, and teacher training practices. These findings provide theoretical and empirical foundations for developing accounting teacher training programs that are not only pedagogically effective but also relevant to industry demands and 21st-century competency development needs.

## **4. Conclusions**

This systematic literature review of 25 articles concludes that accounting vocational teacher training design with Project Based Learning approach to achieve deep learning is urgently needed. The analysis identified three interconnected research themes: Deep Learning perspectives (10 articles), Vocational Teacher Training (6 articles), and Project-Based Learning implementation (9 articles), which collectively support four global trends: increased adoption of PjBL as an innovative method, accounting professional organization demands for active learning, popularity of deep learning concepts integrated with 21st-century skills, and urgency of comprehensive teacher training programs.

Main gaps identified are limitations of relevant training designs for vocational contexts and lack of systematic training development research that integrates deep learning theory, PjBL methodology, and practical teacher development. The needed training design must bridge the gap between theoretical competencies and practical industry applications, emphasizing holistic deep learning achievement encompassing cognitive, interpersonal, and intrapersonal domains.

This research provides a foundation for developing training programs that not only improve teachers' pedagogical competencies in implementing PjBL but also equip them with the ability to design learning that achieves deep learning. Practical implications of this research include the need for collaboration between educational institutions, industry, and policymakers in developing and implementing training designs responsive to vocational accounting education needs in the era of Industry 4.0 and Society 5.0. Future research should focus on developing, implementing, and evaluating comprehensive training programs based on the framework identified in this systematic review.

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