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Integration Model of Occupational Certification Scheme Into Instructional Design to Close The Gap of Learning Outcomes and Industry Needs

Miftakul Azis[1*], Surono Surono[2]
[1]Indonesian Professional Certification Authority, Central Jakarta, DKI Jakarta, Indonesia
[2]Asa Indonesia University, Central Jakarta, DKI Jakarta, Indonesia
Email: azizmoeda@gmail.com[1*], surono.ckp@gmail.com[2]

Abstract

This study addresses the significant gap between the learning outcomes produced by educational institutions and the qualifications required by industry, which has been a persistent issue affecting graduate employability. Despite the implementation of the Independence Curriculum Initiative aimed at enhancing the relevance and application of learning in Indonesia, several barriers hinder its effectiveness, including the misalignment of educational standards with industry needs, limited assessment tools, insufficient learning strategies, inadequate instructional materials, challenges in shifting to competency-based assessments, and the lack of integrated certification schemes. Using a Research and Development (R&D) approach, this study developed two key models: the integration of certification schemes into instructional design and the development of a Semester Learning Plan (SLP) based on this integrated design. The R&D process involved a comprehensive needs analysis, model development, expert validation, and field testing. The findings demonstrate that these models effectively align educational programs with industry standards, enhance the development of assessment tools, improve instructional strategies and materials, and facilitate the validation and certification of skills. Specifically, the models improved the relevance of educational content, the efficacy of assessment tools, and the alignment of instructional strategies with industry demands. This research provides a comprehensive framework for enhancing vocational education and aligning it with industry needs, thereby significantly improving the employability of graduates. The study's implications suggest that the adoption of such integrated models can bridge the gap between education and industry, fostering a more competent and job-ready workforce.

Keywords: Certification Schemes, Instructional Design, Industry Needs, Learning Outcomes, Vocational Education.

INTRODUCTION

In recent decades, education has faced significant challenges in aligning learning outcomes with evolving industry needs. Digital transformation and technological innovation have changed the employment landscape, giving rise to the need for new skills that are often not fully covered in traditional curricula (Nurjanah et al. 2024). In Indonesia, the Curriculum Independence initiative has been introduced as a strategic step to support flexibility and

creativity in the learning process, enabling learners to gain competencies that are more relevant to the needs of the times (Junaidi et al. 2020).

Occupational certification schemes play a crucial role in the labor market by verifying the skills and knowledge of individuals for specific jobs. Cunningham (2019) identify that Occupational certification can serve as an alternative to traditional education by demonstrating the requisite level of proficiency for certain jobs, making them valuable both to individuals looking to advance their careers and to employers seeking qualified candidates. Occupational and competency certification schemes are very important because they validate an individual's ability in certain situations, such as literacy or numeracy (Massing and Schneider 2017). Mlambo et al (2021) identify that Certification and competency schemes are essential in continuous professional development, particularly in the field of nursing. A metasynthetic study shows that continuous professional development (CPD) is important for nurses to maintain and develop their knowledge and skills to conform to expected competency standards. Moreover, Karami, Farokhzadian, and Foroughameri (2017) emphasizes that professional empowerment and competence of an occupation are important factors in human resource management.

Instructional design is developed to ensure that learning materials are relevant to real life and prepare students with the skills and knowledge necessary to succeed outside the classroom environment, including recognition needs such as competency certification. Moreira-Mora and Espinoza-Guzmán (2016) support that Instructional design is developed to ensure that learning materials are relevant to real life and prepare students with the skills and knowledge necessary to succeed outside the classroom environment, including recognition needs such as competency certification. Dick, Carey, and Carey (2015) Instructional design is considered a systematic process involving step-by-step analysis, design, development, implementation, and evaluation of instruction.

Learning outcomes that match job needs or competencies, including competency certifications are important because they help providing relevant and effective education and training to meet industry needs. The importance of learning outcomes in education, especially in the context of Competency-Based Education (CBE), is emphasized through a flexible learning path that can reduce the rate of failure in completion (Oroszi 2020). James (Keevy and Chakroun 2015), defining the relationship between national and regional qualification levels based on learning outcomes, this process becomes clearer and more accessible. European Union (2011), stating that Learning outcomes are critical in determining the relevance of education to industry needs and ensuring that graduates have the competencies needed by the world of work.

Industry needs generally want a curriculum designed based on the real needs of the industry, including technical knowledge, practical skills, and competencies relevant to a particular sector. Ali, Mardapi, and Koehler (2020), stating that the Industry needs TVET (Technical and Vocational Education and Training) providers and users to connect and match policies and strategies to improve the efficiency and effectiveness of TVET systems in

Indonesia. The industry needs a competency certification system to guarantee that employees have skills and knowledge that conform to industry standards (ASEAN 2016).

This research will explore the potential integration of the work certification scheme model into the Independence Curriculum Initiative as an effort to close the gap in learning outcomes and industry needs. By doing this, it is hoped that learners can improve their job readiness, and the industry can obtain a more skilled and ready-made workforce.

This study aims to address these problems by proposing the integration of the work certification scheme model into the instructional design of the Independence Curriculum Initiative, which is expected to create a smoother flow between education and absorption in the job market. As such, the research will provide valuable insight into how educational institutions can adapt to the industry's ever-changing needs and how graduates can be better prepared to meet those demands.

METHODS

The research employs a Research and Development (R & D) approach combined with a Case Study research method (Gall, M., Gall, J., Borg 2015). A widely used Educational Research and Development Model is the System Approach Model, designed by Walter Dick, Lou Carey, and James Carey (Dick, Carey, and Carey, 2015). In this approach, comprehensive (i.e., non-numerical) narrative and visual data are collected, analyzed, and interpreted to gain insights into the phenomenon of employability skills and instructional design development.

The object of this research is the development of a model for integrating certification schemes into instructional design. The research data are sourced from a literature review and relevant data collection aimed at understanding the problem. The population of this study includes experts and practitioners in the field of instructional design and certification scheme development, while the sample consists of a small group involved in preliminary product testing.

The research technique involves several key steps: information gathering and research, planning, preliminary product development, formative evaluation, and model revision. The research tools used include traceable assessment tools for certification competencies, instructional strategies, and instructional materials supporting the required competencies. The key steps in preliminary product development include mapping certification requirements, aligning learning objectives with certification competencies, developing assessment tools, designing instructional strategies, and creating instructional materials.

The data analysis technique involves expert and practitioner evaluation of the certification scheme development and instructional design, along with preliminary field testing to gather feedback and make necessary adjustments. Formative evaluation ensures that the developed model meets the expected standards and needs before broader implementation.

Additionally, this research explores how the integration of certification schemes can be maintained and improved within the Independence Curriculum Initiative. This involves developing recommendations for best practices and sustainable implementation strategies.

Thus, the research not only focuses on model development but also on the ongoing application and enhancement of the model within the educational context.

RESULTS AND DISCUSSION

The integration model developed in this research aims to bridge the gap between educational outcomes and industry requirements by aligning vocational education programs with occupational certification schemes. This section presents the results of the preliminary product development and the evaluation of the prototype models created, along with a discussion of their implications and effectiveness.

Preliminary Product Development:

Create a Prototype Model for Integration of Certification Schemes into instructional design. In the initial stage of product development, a prototype model was created to integrate certification schemes into instructional design. This model aims to bridge the gap between industry needs and learning outcomes, ensuring educational programs align with professional standards and requirements.

Figure 1 illustrates the integration model of certification schemes in instructional design. This model is traceable to the standard (SKKNI 333/2020), technical regulations (Guideline for Independence Curriculum Initiative), and the Dick and Carey Instructional Design model.
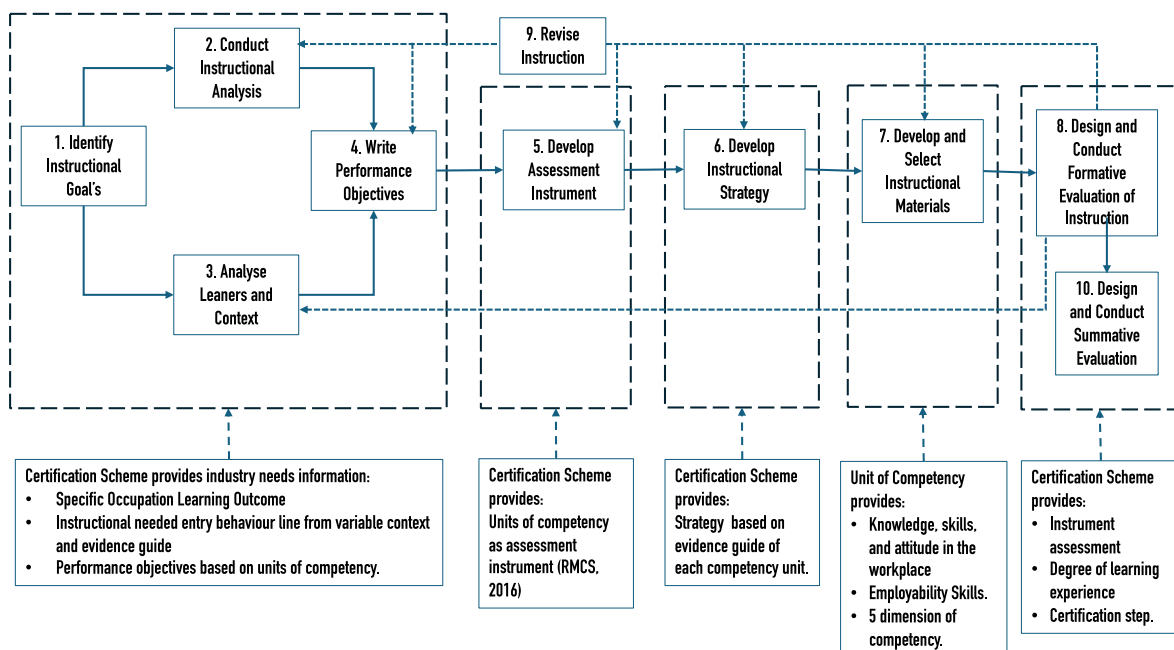
Figure 1. Integration Model of Certification Schemes in Instructional Design to Bridge Industry Needs and Learning Outcomes (Traceable to standard (SKKNI 333/2020), Technical Regulation (Guideline for Independence Curriculum Initiative, and Dick and Carey on DI).

The development of this prototype model involves several key steps, as outlined in the instructional design process. The integration model incorporates industry needs and standards to create a comprehensive framework for educational programs. The certification schemes

provide a structured approach to ensure that graduates possess the necessary skills and competencies required by employers.

1. **Identify Instructional Goals, Conduct Instructional Analysis, Analyze Learners and Context, Write Performance Objectives**: Establish goals that align with industry standards needed for specific job roles. Understand the characteristics of learners and the context of the learning environment. Define clear and measurable objectives. Create tools to evaluate learner performance. Most informations are proded by Certification Scheme.

2. **Develop Assessment Instrument**: Create tools to evaluate learner performance. Certification Scheme provides Units of competency as assessment instrument. ILO (2016) define Competency standards are primarily developed as assessment tools. They define the skills, knowledge, and attributes people need to perform a work role.

3. **Develop Instructional Strategy**: Plan the instructional methods and activities. Certification Scheme provides Strategy based on evidence guide of each competency unit.

4. **Develop and Select Instructional Materials**: Create or choose materials that support learning objectives. Unit of Competency provides: Knowledge, skills, and attitude in the workplace, Employability Skills, and five dimension of competency.

5. **Design and Conduct Formative Evaluation**: Gather feedback to improve the instructional design. Certification Scheme provides Instrument assessment, and Degree of learning experience

6. **Revise Instruction**: Make necessary adjustments based on feedback.

7. **Design and Conduct Summative Evaluation**: Assess the overall effectiveness of the instructional design. Certification Scheme provides: instrument assessment, degree of learning experience, and certification steps.

By following these steps, the prototype model ensures that educational programs are not only academically rigorous but also practically relevant, providing students with the skills needed to succeed in the workforce.

The integration of certification schemes into instructional design enhances the alignment between education and industry, fostering better employability outcomes for graduates. Bajracharya (2019) explains that incorporating instructional design principles creates a structured, technology-integrated instructional process that aligns learning objectives with industry standards. Similarly, Daka et al. (2023) emphasize the need to align educational curricula with industry requirements to ensure graduates possess the necessary skills and knowledge for the job market. Stefaniak, Reese, and McDonald (2020) also highlight the importance of aligning instructional design practices with industry demands to equip graduates with essential competencies. Furthermore, Martin and Ritzhaupt (2021) identify that this integration ensures graduates are well-prepared with relevant competencies, thus enhancing their employability. Radović, Hummel, and Vermeulen (2021) underscore that incorporating experiential learning models helps create learning environments that closely

mimic real-world professional contexts, thereby further aligning education with industry needs.

Design Semester Learning Plan

In the second phase of prototype development, a Semester Learning Plan (SLP) was designed for vocational education, integrating instructional design principles and certification schemes. Directorate General of Learning and Student Affairs (2016) defines the Semester Learning Plan (SLP) of a course as a learning process plan prepared for learning activities for one semester to meet the learning outcomes charged in the course/module. This design aims to ensure that the curriculum meets industry standards and enhances the employability of graduates.
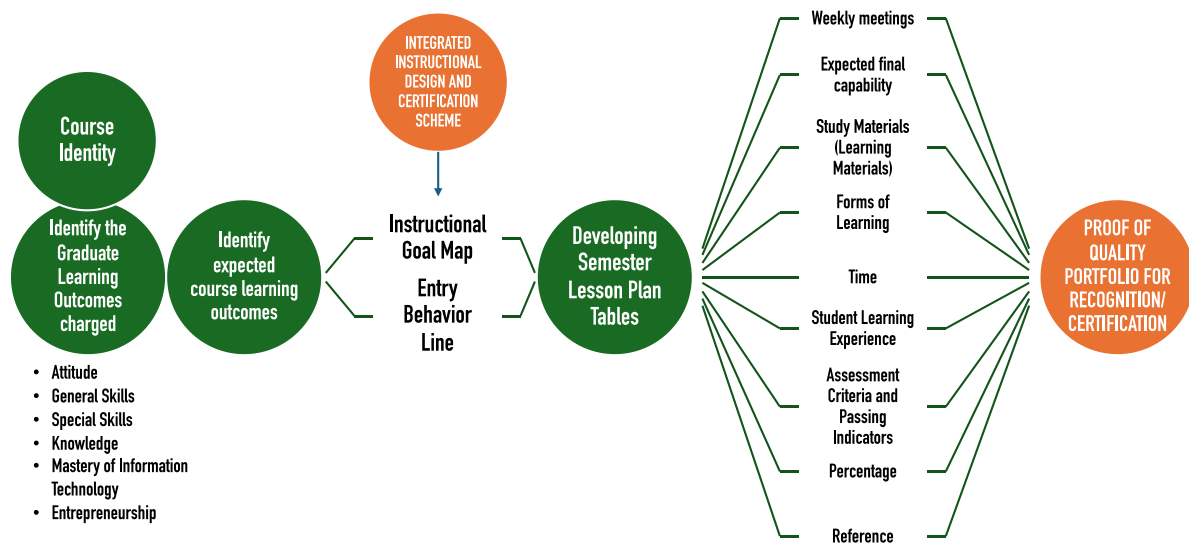

Figure 2. Semester Learning Plan Design for Vocational Education based on integrated Instructional Design and certification scheme

The SLP design process involves several key steps based on instructional design that has been integrated with the certification scheme:

1. **Course Identity**: Identify the course and define its identity. Specify the Graduate Learning Outcomes, including attitudes, general skills, special skills, knowledge, mastery of information technology, and entrepreneurship.

2. **Identify Expected Course Learning Outcomes**: Establish clear and expected outcomes for each course. Ensure these outcomes align with the competencies required by the certification scheme.

3. **Instructional Goal Map and Entry Behavior Line**: Develop an instructional goal map to outline the objectives and goals for the semester. Identify entry behaviors to understand the starting point of learners.

4. **Developing Semester Lesson Plan Tables**: Create detailed tables for the semester lesson plan, which include: Weekly meetings and expected final capacity, Study materials and learning resources, Various forms of learning activities, Time allocation for each activity,

Student learning experiences and assignments, Assessment criteria and grading percentages, and References and additional resources. In this step, the Certification Scheme provides most of the information needed by this table of the Semester Learning Plan accurately.

5. **Proof of Quality Portfolio for Recognition Certification**: Compile a portfolio that provides evidence of quality and supports the recognition and certification process.

By following these steps, the SLP ensures that the instructional design is comprehensive and aligns with industry standards. The integration of certification schemes into the learning plan provides a structured approach to achieving desired learning outcomes and competencies. This method not only prepares students for the workforce but also validates their skills through recognized certification processes. Weng and Chiu (2023) highlight the importance of aligning instructional design with certification standards to ensure that educational programs meet industry requirements. Similarly, Sitepu and Lestari (2018) identify that a structured SLP ensures the curriculum is aligned with industry standards, helping students acquire relevant competencies and skills needed in the job market. Sangsawang (2020) found that using a structured instructional design supported by multimedia games and achievement tests significantly improved students' learning achievements and satisfaction. Additionally, Efendi, Jama, and Yulastri (2019) emphasize that a competency-based learning model ensures that learning objectives are clearly defined and aligned with industry requirements. Finally, Krismadinata et al. (2020) highlight that blended learning models ensure that vocational education closely aligns with industry needs when integrated with certification schemes.

Therefore, the development of the SLP is crucial for creating a cohesive and effective vocational education program that meets the industry's dynamic needs. The design focuses on practical and applicable skills, ensuring that graduates are well-prepared for their future careers.

Formative Evaluation

Survey Results Data from Experts

The results of a survey conducted on three experts in the field of Educational Technology as well as observers who specialize in the development of competency certification, have provided significant insights related to the research topic. These experts have provided their valuable assessments and views, which have been compiled and processed to produce comprehensive data. This data has been systematically compiled and realized in an easily understandable format, as shown in Table 1 below. The table covers the various aspects reviewed, from experts' perceptions of the effectiveness of current certification schemes to their suggestions and recommendations for future improvement. Thus, this table presents an important summary of the survey findings, which will be discussed further in the analysis later in the next chapter.

Table 1. Respondent Data of Educational Technology Experts and Observers of Certification Development with Likert scale.

ASPECTS	E1	E2	E3	AVERAGE
1. Certification Scheme In Ensuring The Accuracy Of Determining Graduate Learning Outcomes (Graduate Profile).				
• LO Identification	5	3	4	4.0
• User Needs Identification	5	4	5	4.7
• Competence Elements Analysis	5	5	4	4.7
• Performance Results & Indicators	5	5	5	5.0
2. Certification Scheme In Facilitating The Development Of Learning Assessment Tools.				
• Assessment Instruments Development	5	5	5	5.0
• Validation of Assessment Instruments	5	5	5	5.0
3. Certification Scheme In Providing Alternative Learning Strategies				
• Context-based Learning Strategies	5	5	3	4.0
• Experience-based Learning Strategies	5	5	3	4.3
4. Certification Scheme In Providing Direction In The Development Of Instructional Materials				
• Themes and Topics Identification	5	4	4	4.3
• Skills and Attitudes Identification	5	4	5	4.7
• Learning Context Variations	5	5	4	4.0
• Competency Competition Dimension	5	3	4	4.0
• SOPs for Learning Practices	5	5	4	4.7
• Workbooks as Quality Evidence	5	5	5	5.0
5. Certification Scheme In Providing Guidance In The Evaluation Of Competency-Based Learning.				
• Formative Evaluation of Learning	5	5	4	4.7
• Corrective Actions Development	5	5	5	5.0
6. Certification Scheme In Ensuring Recognition And Certification?				
• Internal Recognition of Achievement	5	5	3	4.3
• Certification Submission	5	5	3	4.3
AVERAGE				4.6

Table 1 visualizes the average satisfaction levels of three experts on various aspects of the integration of certification schemes into vocational education instructional design. Overall, these results indicate that experts find the integration of certification schemes into vocational education instructional design highly beneficial, particularly in developing assessment instruments, validating those instruments, and providing clear performance results and indicators. Some areas, such as context-based learning strategies, could still be improved.

The results of a survey conducted on nine practitioners

More extensive surveys have been conducted to deepen understanding of the integration of competency certification schemes in educational contexts. Nine education practitioners who are directly involved in developing and implementing competency certification in the educational environment have participated in this survey. With their diverse

expertise and experience, these practitioners provide unique and in-depth perspectives on the sustainability and effectiveness of existing practices.

The data obtained from this survey, which covers aspects such as practitioners' perceptions of the current framework, identification of barriers to implementation, as well as suggestions for improvement, have been processed and summarized. The data processing results have been consolidated and presented in Table 2 below. This table provides a clear and structured picture of practitioners' responses and views, which will form the basis for further discussion and analysis in the next sections of the next chapter.

Table 2. The results of a survey were conducted on nine practitioners using a Likert scale

Aspects	ECP1	ECP2	ECP3	ECP4	ECP5	ECP6	ECP7	ECP8	ECP9	Average
Learning Outcome Identification	5	4	4	5	5	4	5	5	4	4.6
User Needs Identification	5	4	4	5	4	4	5	5	4	4.4
Competence Elements Analysis	5	4	4	5	4	4	5	4	4	4.3
Performance Results & Indicators	5	4	4	4	5	4	5	3	4	4.2
Assessment Instruments Development	4	5	5	5	5	5	5	5	5	4.9
Validation of Assessment Instruments	3	5	5	4	4	5	5	4	5	4.4
Context-based Learning Strategies	4	4	3	4	5	4	5	3	4	4.0
Experience-based Learning Strategies	4	4	3	5	5	4	5	3	4	4.1
Themes and Topics Identification	4	5	5	4	4	4	5	5	5	4.6
Skills and Attitudes Identification	5	5	5	5	4	4	5	5	5	4.8
Learning Context Variations	4	4	4	4	4	4	5	4	4	4.1

Competency Competition Dimension	3	4	4	4	3	3	5	5	2	3.7
SOPs for Learning Practices	5	3	3	4	5	5	5	5	3	4.2
Workbooks as Quality Evidence	4	3	3	5	5	5	5	1	4	3.9
Formative Evaluation of Learning	4	4	4	4	5	4	5	4	4	4.2
Corrective Actions Development	2	4	4	4	4	4	5	4	3	3.8
Internal Recognition of Achievement	4	4	4	4	4	4	5	4	3	4.0
Certification Submission	5	5	5	5	5	5	5	5	4	4.9

Overall, these results indicate that practitioners find the integration of certification schemes into vocational education instructional design beneficial, with particular strengths in developing assessment instruments and submitting competency certifications. Some areas, such as identifying the competency competition dimension, could be improved.
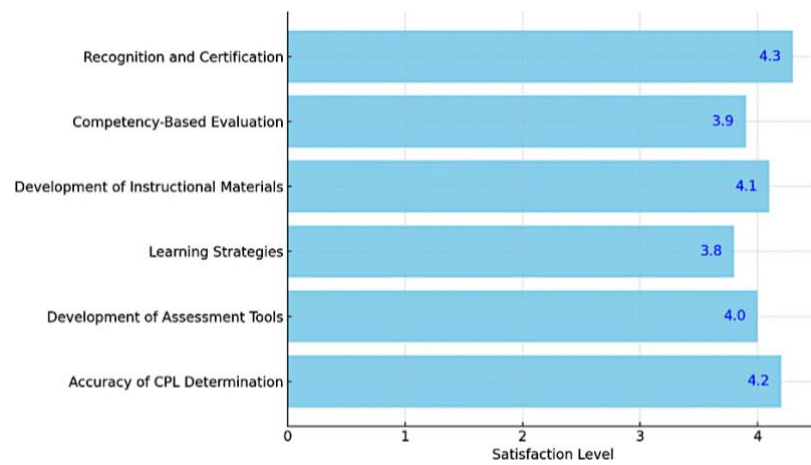
Formative Evaluation Results of Participants in Certification Scheme Integration

A formative evaluation was conducted on an instructional design trial class of 24 participants to apply the certification scheme integration model in instructional design. Evaluation is carried out against:

1. **Accuracy of Graduate Learning Outcomes Determination**: Evaluation of the certification scheme in ensuring the accuracy of Graduate Learning Outcomes determination.
2. **Development of Learning Assessment Tools**: Evaluation of the certification scheme in facilitating the development of learning assessment tools.
3. **Learning Strategies**: Evaluation of the certification scheme in providing alternative learning strategies.
4. **Development of Instructional Materials**: Evaluation of the certification scheme in guiding the development of instructional materials.
5. **Competency-Based Learning Evaluation**: Evaluation of the certification scheme in providing guidance for competency-based learning evaluation.
6. **Recognition and Certification**: Evaluation of the certification scheme in ensuring recognition and certification.

    The results of the evaluation survey from trial participants of the application of the certification scheme integration model in instructional design can be illustrated as below.

Figure 3. Formative Evaluation Results of Participants on Certification Scheme Integration with Likert scale

The bar chart shows the participant satisfaction levels for six key aspects of the integration of certification schemes into vocational education instructional design. Overall, these results indicate that the integration of certification schemes into vocational education instructional design is well-received by participants, with some areas that could be further improved.

The results of this research highlight the effectiveness of integrating occupational certification schemes into instructional design. This integration addresses several key problems identified in the preliminary stages of the study. Here, we present the findings and discuss how they directly address the identified issues:

1) The lack of alignment of standards to establish graduate learning outcomes is addressed by the integration model, which ensures that educational programs are aligned with industry standards. This alignment enhances learning outcomes' relevance and applicability to specific job roles. By incorporating certification requirements into the instructional design, the educational curriculum is tailored to meet actual workplace competency needs. This approach effectively bridges the gap between academic standards and the practical skills required in the industry. Pereira et al. (2024) identify that by integrating constructive alignment principles into course design, the framework ensures that educational programs meet industry standards and expectations, thereby enhancing the relevance and applicability of learning outcomes. Zhao, Zhao, and Li (2023) highlights that aligning teaching, learning, and assessment activities with curriculum standards significantly enhances the effectiveness of educational programs.

2) The issue of limited standard assessment instruments to measure graduate learning outcomes is addressed by the development of assessment instruments within the integration model, providing standardized tools to evaluate learner performance effectively. Certification schemes offer validated units of competency that serve as reliable assessment instruments, ensuring that graduate learning outcomes are measured accurately and consistently. L. Martin and Mahat (2017) demonstrate how the

development of standardized assessment instruments within the integration model can effectively address the issue of limited tools for measuring graduate learning outcomes, ensuring that assessments are both reliable and aligned with industry standards. Zhang, Liu, and Feng (2023) also demonstrate that the development of assessment instruments within the integration model effectively addresses the issue of limited tools for measuring graduate learning outcomes, ensuring that assessments are reliable, valid, and aligned with industry standards.

3) The issue of limited reference to learning strategies to provide learning efficiency and effectiveness is addressed by the integration model, which incorporates diverse instructional strategies based on certification schemes. Certification schemes provide evidence-based instructional strategies that enhance learning efficiency and effectiveness. By aligning these strategies with instructional design, the learning experience becomes more structured and goal-oriented. Dori et al. (2023) demonstrate how an integrated certification scheme provides evidence-based learning strategies that improve learning efficiency and effectiveness, as well as skill validation through a recognized certification process. Peng, Razak, and Halili (2023) demonstrate that incorporating diverse instructional strategies based on certification schemes can significantly enhance the efficiency and effectiveness of learning by providing a structured and evidence-based approach to instructional design.

4) The issue of limited traceable and contextual instructional materials based on standards and graduate learning outcomes is addressed by ensuring that the development and selection of instructional materials are guided by the certification units of competency. Certification schemes provide detailed knowledge, skills, and attitudes required in the workplace. This guidance ensures that instructional materials are contextually relevant and traceable to industry standards, thereby enhancing the learning process. Surono (2023) demonstrates how the integration model enhances the learning process by ensuring that instructional materials are designed and selected based on robust, industry-aligned certification standards, thereby improving the quality and applicability of vocational education. Portana et al. (2021) also illustrate how the integration model effectively addresses the issue of limited reference materials by using certification units of competency to guide the development and selection of instructional materials, ensuring they are both contextually relevant and aligned with industry standards

5) The difficulty for educational institutions to change the paradigm of examinations to competency-based assessments in learning evaluation is addressed by the model's inclusion of a shift towards competency-based assessments. Integrating certification schemes into instructional design facilitates this paradigm shift from traditional examinations to competency-based assessments, which is crucial for evaluating practical skills and competencies directly applicable in the workplace. Frank et al. (2024) highlight how the integration of certification schemes into instructional design addresses the difficulty of transitioning to competency-based assessments, ensuring that graduates are well-prepared for their professional roles. Gulled (2023) identifies that integrating

certification schemes into instructional design facilitates this paradigm shift from traditional examinations to competency-based assessments, which is crucial for evaluating practical skills and competencies directly applicable in the workplace.

6) The issue of validation, recognition, and certification of skills is addressed by the integration model, which emphasizes the validation and certification of skills through recognized industry standards. Certification schemes provide a structured process for validating and recognizing skills, which is critical for graduates to demonstrate their competencies to potential employers, thus enhancing their employability and career prospects. Duvekot, Coughlan, and Aagaard (2017) found that certification schemes provide a structured process for validating and recognizing skills, which is critical for graduates to demonstrate their competencies to potential employers, thus enhancing their employability and career prospects. Strong et al. (2020) emphasizes the importance of integrating certification schemes into educational programs to address the validation, recognition, and certification of skills.

CONCLUSION

This research successfully developed two key models: the integration model of certification schemes into instructional design and the model for developing a Semester Learning Plan (SLP) based on an instructional design integrated with certification schemes. These models effectively address the gap between educational outcomes and industry requirements by ensuring that vocational education programs align with industry standards and enhance graduates' employability. The findings demonstrate that the integration model ensures alignment with industry standards, provides standardized assessment tools, incorporates diverse instructional strategies, and emphasizes competency-based assessments and validation of skills through recognized industry standards. Recommendations include policymakers adopting the integration model to bridge the education-industry gap, educational institutions incorporating certification schemes into curricula, and continuous collaboration between educational institutions and industry stakeholders. Future research should focus on longitudinal studies to assess long-term impacts, explore the model's applicability across different fields and regions, investigate the role of emerging technologies, and develop robust feedback mechanisms from industry stakeholders to refine and improve the integration model continuously.

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