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THE QUALITY OF PRE-SERVICE TEACHERS' INSTRUCTIONAL MODULE PROJECTS: CONSTRUCTIVE ALIGNMENT PRINCIPLES

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ABSTRACT

Instructional modules developed by pre-service teachers are expected to demonstrate coherent alignment among learning outcomes, instructional activities, and assessment tasks. However, previous studies suggest that student-generated instructional products often prioritize structural completeness over pedagogical coherence, resulting in weak integration of key instructional components. This study aimed to evaluate the pedagogical quality of pre-service teachers' instructional modules through the lens of constructive alignment and to identify recurring patterns of alignment and misalignment. Employing a qualitative document analysis with a rubric-based evaluative approach, the study analyzed eighteen instructional modules developed by fifth-semester students in an English Language Education program at a private university in Surabaya, Indonesia. The analytical rubric examined the alignment among Intended Learning Outcomes (ILOs), Teaching and Learning Activities (TLAs), Assessment Tasks (ATs), cognitive levels based on Bloom's Taxonomy, instructional models, and the integration of the Pancasila Student Profile. The findings showed that 77.8% of the modules demonstrated high alignment, 16.7% showed partial alignment, and 5.5% exhibited low alignment. Highly aligned modules displayed coherent relationships among learning objectives, instructional activities, and authentic assessment practices, particularly through student-centered approaches such as Project-Based Learning and Discovery Learning. Nevertheless, recurring weaknesses were identified in the formulation of measurable objectives, explicit cognitive-level mapping, and the development of analytic assessment rubrics. The study highlights the value of constructive alignment not only as a design principle but also as an evaluative framework for assessing pedagogical coherence in student-generated instructional products. The findings further underscore the need for practice-oriented scaffolding and assessment literacy training to strengthen pre-service teachers' instructional design competence.

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INTRODUCTION

Instructional design plays a pivotal role in ensuring that learning experiences are systematically structured, pedagogically effective, and aligned with clearly defined learning outcomes (Karthik et al., 2019; Abuhassna & Alnawajha, 2023). In higher education, particularly in teacher education and educational technology programs, instructional design courses aim to equip pre-service teachers with both theoretical understanding and practical competencies in developing effective instructional products (Valtonen et al., 2020; Wah & Hashim, 2021; Arochman & Fortinasari, 2024). One of the most common forms of project-based assessment in these courses is the development of instructional modules. This task requires students to integrate learning objectives, instructional strategies, learning activities, and assessment methods into a coherent and learner-centered instructional system (Elizabeth et al., 2024; Guaya et al., 2025).

Instructional modules, as an integrative learning module, are expected to reflect students' understanding of core instructional design components, including learning objectives, content organization, instructional strategies, learning activities, and assessment methods (Basu, 2018). Ideally, these components function as an interconnected system in which learning objectives guide content selection and sequencing, inform instructional activities, and determine appropriate assessment strategies (Darling-Hammond et al., 2017; Khan et al., 2025). However, existing research consistently indicates that student-generated instructional materials tend to prioritize structural completeness, such as formatting, layout, and topic coverage, over pedagogical coherence (de Koning et al., 2021; Ribosa & Duran, 2022; Hattie, 2025). Consequently, instructional modules may appear comprehensive on the surface but fail to promote meaningful learning due to weak alignment among intended learning outcomes, instructional processes, and assessment practices (Bull, 2025; Levy-Feldman, 2025). This issue reflects a broader challenge in instructional design education, where learning outcomes, instructional activities, and assessment components are often treated as discrete elements rather than as parts of an integrated instructional system (Alqassab et al., 2023; Hattie, 2025). Such fragmentation results in instructional products that meet formal or technical requirements but remain pedagogically weak, thereby limiting their potential to support deep learning and the realization of intended educational goals (Alsaleh, 2020). Accordingly, there is a critical need for systematic approaches to evaluate the internal coherence and pedagogical quality of student-generated instructional products.

Constructive Alignment, originally proposed by Biggs (1996) provides robust theoretical principles for addressing issues of pedagogical coherence in instructional design. Grounded in constructivist learning theory, these principles posit that meaningful learning occurs when Intended Learning Outcomes (ILOs), Teaching and Learning Activities (TLAs), and Assessment Tasks (ATs) are intentionally and systematically aligned (Hamdoun, 2023; Senadheera et al., 2024). Within these principles, learning outcomes define expected student performance using observable and measurable verbs. Instructional activities engage learners in processes that directly support the achievement of these outcomes, while assessment tasks validly measure the extent to which the outcomes have been attained (Dahl & Mørch, 2025; Munna & Kalam, 2021).

An increasing body of research shows that aligned instructional designs foster deeper learning strategies, boost student engagement, and enhance learning outcomes (Meng, 2023; Oo et al., 2024). In contrast, misalignment among outcomes, activities, and assessments often leads to surface learning, assessment-driven behaviours, and diminished instructional effectiveness. Despite its strong theoretical and empirical foundation, constructive alignment has been predominantly applied as a prescriptive principle for curriculum development and instructional planning (de Koning et al., 2021; Lawrence, 2023). Their application as an

evaluative lens for analysing the pedagogical quality of student-generated instructional products remains relatively underexplored (Hailikari, 2022; Holland, 2023).

This limitation reveals a significant empirical gap. In instructional design education, student-generated modules, particularly instructional modules, are frequently used as primary indicators of learning achievement. However, without a systematic alignment-based evaluation, it is difficult to determine whether these modules demonstrate genuine pedagogical coherence or merely satisfy formal or structural requirements (Lindvall & Ryve, 2019; Yongco & Valle, 2022). Consequently, instructional modules that appear adequate on the surface may lack the substantive alignment necessary to facilitate meaningful and assessable learning experiences (Logan et al., 2021; Pingil, 2017).

Furthermore, in the context of Indonesian education, there is a growing expectation for instructional design to incorporate the Pancasila Student Profile (PSP) as a representation of holistic learner competencies (Maria et al., 2025; Islamiah et al., 2024). However, its integration within alignment-based principles remains under-theorized. In this study, PSP is conceptualized as an extended outcome dimension that complements cognitive learning outcomes, thereby broadening the scope of alignment to include both academic and character-based competencies (Chotimah et al., 2025).

To address these gaps, the present study reconceptualizes constructive alignment not only as a design principle but also as an evaluative principle for assessing the pedagogical quality of instructional module projects developed by pre-service teachers (Stamov Roßnagel et al., 2021; O'Sullivan & Bjørndal, 2024). Specifically, the study operationalizes constructive alignment into a rubric-based analytical tool that enables systematic, transparent, and consistent evaluation of alignment among learning outcomes, instructional activities, and assessment tasks (Ait-hroch et al., 2025).

This study makes three main contributions. First, it extends constructive alignment from a prescriptive design principle into an analytical instrument for evaluating instructional modules. Second, it offers a methodological contribution by translating alignment principles into a structured rubric with measurable indicators applicable to project-based assessment contexts. Third, it provides empirical insights into patterns of alignment and misalignment in student-generated instructional modules, thereby addressing ongoing concerns regarding the pedagogical validity of project-based learning outcomes in higher education.

Accordingly, this study was guided by the following research questions: (1) To what extent are Intended Learning Outcomes (ILOs), Teaching and Learning Activities (TLAs), and Assessment Tasks (ATs) aligned in pre-service teachers' instructional modules? (2) What patterns of alignment and misalignment emerge when these modules are analyzed using the constructive alignment principles?

RESEARCH METHOD

Research Design

The study is best described as a qualitative document analysis that utilized a rubric-based evaluative approach. Document analysis was chosen as the principal methodological approach because instructional modules are genuine and measurable indicators of students' instructional design competencies. Unlike self-reported data, such as interviews or questionnaires, which may show the perception rather than actual practices, these modules provide direct insight into how decisions about teaching are made and how they are built into design products. This facilitated systematic analysis of the construction and alignment of essential instructional components, specifically Intended Learning Outcomes (ILOs), Teaching and Learning Activities (TLAs), and Assessment Tasks (ATs) within the modules.

The qualitative descriptive design enabled a comprehensive analysis of alignment, as it was distinctly manifested in the instructional modules. It made it possible to determine not only

whether there was alignment but also how strong, consistent, and high-quality the coherence was across all parts of the instruction. Moreover, this method facilitated a detailed examination of the pedagogical choices made by pre-service teachers, encompassing the formulation of learning objectives, the structuring of instructional activities to actualize these objectives, and the design of assessment tasks to accurately evaluate learning outcomes. The study elucidated the intricacies of instructional design methods in authentic educational settings. It offered significant insights into the calibre of pre-service teachers' pedagogical reasoning and the development of professional competence.

To improve analytical rigour and consistency, the study employed a rubric-based analytical approach grounded in the constructive alignment principles formulated by Biggs & Tang (2011). Even though the rubric gave each alignment dimension a number score, these ratings were not used as statistical data for inferential analysis. Instead, they served as analytical scaffolding to help with systematic categorisation, comparison, and interpretation across different training modules. Consequently, meaning was extracted not from the numerical scores per se but from the qualitative analysis of alignment patterns seen in the modules. In this regard, the study can be accurately characterised as qualitative evaluative research supplemented by structured analytical support.

To improve the analysis and ensure it was grounded in both theoretical principles and empirical evidence, the study employed a dual analytical approach combining deductive and inductive methods. The initial phase involved a logical, theory-driven examination grounded in constructive alignment, an educational design principle that ensures that learning activities and assessment tasks align with intended learning outcomes. Standardised rubric indicators were applied to assess the essential elements of pedagogical alignment systematically. These included how well learning outcomes, instructional activities, and assessment tasks aligned, how consistent the cognitive levels were across these components, and how authentic and appropriate the assessment practices were. This phase ensured that the analysis remained grounded in theory, was organised, and remained consistent across all instructional modules.

Subsequently, an inductive, data-driven thematic analysis was performed to identify recurring patterns and differences across cases. Qualitative evidence of alignment and misalignment was systematically coded and analysed via cross-case comparison, facilitating the identification of persistent strengths, such as structural organisation and logical sequencing, alongside recurring weaknesses, including ambiguous learning objectives, misaligned assessment tasks, and insufficient cognitive demand. Analytical memos throughout the process were implemented to record new ideas, interpretive thoughts, and explanatory links. This step enabled the analysis to progress from mere descriptive categorisation to a more profound interpretation, especially in elucidating the reasons for alignment attainment or failure in certain instructional contexts.

The combination of deductive and inductive methods created comprehensive analytical principles that were both theoretically sound and context-sensitive. The deductive part ensured that the results aligned with established theoretical concepts, while the inductive part allowed new insights to emerge from the empirical data. This combination is especially good for research on instructional design, because both fidelity to theory and variability in practice need to be examined simultaneously. In general, this methodological approach enabled a clear, thorough, and methodical assessment of the pedagogical quality of instructional modules while also demonstrating the complexity and authenticity of the lesson planning of pre-service teachers.

Participants

This study used purposive sampling in a specific instructional setting to gain detailed, contextually rich insights into students' instructional design projects. The participants were 18

fifth-semester undergraduate pre-service teachers enrolled in an instructional design course in an English-language education program at a private university in Surabaya. All participants had completed a full semester of training in instructional design, including curriculum development, lesson planning, and outcomes-based education. Total population sampling was used, including all students who completed the final instructional module project. This approach ensured comprehensive coverage and minimised selection bias.

The primary data comprised 18 instructional modules developed as final projects, representing students' cumulative learning outcomes and designed for junior and senior high school English contexts. The unit of analysis was the instructional modules rather than the participants; each module was treated as an independent case to allow systematic examination of the alignment among Intended Learning Outcomes (ILOs), Teaching and Learning Activities (TLAs), and Assessment Tasks (ATs). Given the qualitative descriptive approach, the sample size was deemed sufficient for generating detailed, contextually grounded insights. Analysis was performed using a constructive alignment-based analytical rubric, enabling in-depth and cross-case comparison. Ethical procedures, including informed consent, anonymisation, and secure data management, were strictly followed to ensure the study's credibility and integrity.

Instruments

Data were gathered through systematic document analysis of student-developed instructional modules, each treated as a separate unit of analysis and examined in full to assess pedagogical quality. The analysis concentrated on key instructional components, including specified learning outcomes, teaching and learning activities, instructional strategies, media use, and assessment tasks. This comprehensive examination allowed the study to evaluate how well these elements functioned as an integrated instructional system and reflected a coherent pedagogical design.

To ensure consistency and transparency in evaluation, an analytical rubric based on constructive alignment theory, developed by Biggs & Tang (2011), was used. The rubric translated alignment principles into observable indicators across three main dimensions: (1) the clarity and measurability of learning outcomes, (2) the alignment of teaching and learning activities with intended outcomes, and (3) the consistency of assessment tasks with both outcomes and activities. Each dimension was rated on a four-point scale from low to very high alignment. To add depth and context, additional indicators were included, such as cognitive-level alignment with Bloom's Taxonomy, coherence between instructional models and anticipated learning products, and the incorporation of competency principles, such as the Pancasila Student Profile (PSP).

The rubric was developed deductively from constructive alignment principles and refined through peer review by experts in instructional design and teacher education to ensure content validity, clarity, and theoretical consistency. Reliability was ensured through systematic procedures, including the use of standardised scoring guidelines, maintaining an audit trail of scoring decisions and justifications, and recoding selected modules to promote consistency. Although numerical scores were assigned, they were not used for statistical analysis; rather, they served as guiding principles to aid systematic categorisation and qualitative interpretation of alignment patterns. In this way, the rubric functioned both as an evaluative tool and an interpretive principle, maintaining the credibility, dependability, and transparency of the analysis.

Data Analysis

Data analysis in this study followed an interactive, iterative approach inspired by Miles et al. (2014), which underscores the interconnected processes of data reduction, data display, and conclusion drawing/verification. The analysis was carried out within these principles

through a three-stage integrated procedure. This method combined deductive rubric-based evaluation with inductive thematic interpretation, facilitating a systematic transition from structured measurement to a deeper understanding of pedagogical alignment within instructional modules.

The first stage involved data reduction through a deductive evaluation using a constructive alignment-based analytical rubric. Each instructional module was assessed across key dimensions, including the clarity of learning outcomes, the alignment of teaching and learning activities, and the congruence of assessment tasks, with scores assigned on a four-point scale. During this process, qualitative annotations were recorded to capture evidence of alignment and misalignment, as well as notable instructional design features. Analytic memos were also developed to document emerging insights and recurring issues, thereby condensing raw data into meaningful analytical units and linking numerical scoring with qualitative interpretation.

The second stage involved data display through organizing data into structured analytical matrices, enabling systematic cross-case comparison. Each instructional module was treated as a unit of analysis and mapped against key alignment indicators to identify patterns, similarities, and variations. To improve interpretability, total rubric scores were converted to percentages and categorised into four levels of pedagogical alignment: very high (85–100%), high (70–84%), partial (50–69%), and low (<50%). This categorisation provided a transparent and replicable principle for analysis and established a clear connection between numerical results and qualitative findings. Borderline cases were re-examined through iterative comparison of scores and qualitative evidence to ensure consistency.

The final step was to draw conclusions and verify them through inductive thematic analysis. Qualitative data from annotations, module content, and analytic memos were coded to identify recurring patterns of alignment and misalignment, which were then synthesised into broader themes, including structural alignment, cognitive progression, assessment quality, and technical precision in instructional design. Conclusions were formulated through ongoing comparisons between rubric scores and qualitative evidence, bolstered by iterative verification processes to guarantee internal consistency. Although rubric scores introduced a structured element, the analysis remained predominantly qualitative, with numerical data serving as analytical entry points and thematic interpretation providing explanatory depth. The integration of deductive and inductive approaches ensured that the findings reflect both measurable alignment levels and contextually grounded insights into instructional design practices, thereby strengthening the credibility, dependability, and overall trustworthiness of the analysis.

RESEARCH FINDINGS AND DISCUSSION

Research Findings

The analysis of eighteen instructional modules revealed varying degrees of constructive alignment across Intended Learning Outcomes (ILOs), Teaching and Learning Activities (TLAs), and Assessment Tasks (ATs). Based on the rubric-based evaluation, the modules were categorized into three levels of pedagogical alignment: highly aligned, partially aligned, and low aligned. Fourteen modules (77.8%) demonstrated high alignment, three modules (16.7%) showed partial alignment, and one module (5.5%) was categorized as low aligned.

Table 1
The constructive alignment analysis of the student learning module

No.	Respondent	Outcome-Objective	Objective-Activity	Activity-Assessment	Cognitive	Project	PSP	Category
1	RY	A	HA	A	A	A	A	Aligned
2	RC	HA	HA	HA	A	HA	A	High Aligned

3	RA	HA	HA	HA	HA	HA	HA	High Aligned
4	RR	A	A	A	PA	A	A	Aligned
5	RA	A	HA	HA	HA	HA	A	High Aligned
6	RH	HA	HA	HA	HA	HA	HA	High Aligned
7	RI	HA	HA	A	HA	A	A	High Aligned
8	RG	PA	PA	LA	LA	PA	PA	Low Aligned
9	RR	A	A	HA	A	HA	A	Aligned
10	RU	A	HA	HA	A	A	A	Aligned
11	RZ	HA	HA	A	HA	A	A	High Aligned
12	RZ	HA	HA	HA	HA	HA	HA	High Aligned
13	RN	HA	HA	HA	A	HA	A	High Aligned
14	RR	HA	HA	HA	HA	HA	HA	High Aligned
15	RT	PA	PA	A	PA	A	PA	Partially Aligned
16	TM	HA	HA	HA	HA	HA	HA	High Aligned
17	RA	A	HA	HA	A	A	A	Aligned
18	RE	A	A	PA	A	A	HA	High Aligned

Although the overall distribution suggests that most pre-service teachers were able to operationalize the principles of constructive alignment at a structural level, the analysis also identified recurring procedural weaknesses that limited the precision and pedagogical coherence of several modules.

The highly aligned modules demonstrated strong continuity between learning outcomes, instructional processes, and assessment practices. In these modules, learning objectives were generally formulated using observable operational verbs, instructional activities were sequenced progressively, and assessment tasks reflected the targeted competencies. A dominant pattern identified across these modules was the use of student-centered instructional models, particularly Project-Based Learning (PjBL) and Discovery Learning, which facilitated meaningful integration between learning activities and expected learning products. For instance, several modules required students to produce authentic outputs such as digital posters, oral presentations, role-play performances, and collaborative projects. These products were directly connected to intended competencies and were supported by activities that progressively guided learners toward task completion. Such alignment indicates that pre-service teachers were able to conceptualize instruction as an integrated pedagogical system rather than as isolated instructional components.

Another prominent characteristic of highly aligned modules was the presence of implicit cognitive progression consistent with Bloom's Taxonomy. Learning activities commonly progressed from lower-order cognitive processes, such as identifying and understanding concepts, toward higher-order processes involving analysis, creation, and evaluation. In several modules, this progression was reflected in the sequencing of instructional tasks, beginning with guided exploration activities before moving toward independent project production or problem-solving tasks. However, despite this emerging cognitive coherence, the alignment was frequently implicit rather than explicitly documented. Many modules did not clearly specify cognitive levels in their learning objectives or assessment criteria, indicating that pre-service teachers were often able to apply higher-order instructional principles intuitively without fully articulating them in technical instructional language.

The analysis further revealed that authentic assessment practices constituted both a strength and a recurring limitation across the modules. On one hand, many highly aligned modules incorporated performance-based and product-oriented assessments that reflected real-world language use and contextualized learning. Assessment tasks frequently required students to demonstrate communicative competence through presentations, collaborative discussions, or creative products, thereby supporting the principles of authentic learning. On the other hand, the quality of assessment design varied considerably. While assessment tasks were generally

relevant to learning activities, many modules lacked explicit analytic rubrics, measurable performance indicators, or clear criteria linking assessment outcomes to intended competencies. As a result, alignment was often achieved at the conceptual level but weakened at the procedural level due to insufficient assessment precision.

Partially aligned modules exhibited a different pattern characterized by inconsistencies in the operationalization of alignment principles. Although these modules generally demonstrated awareness of the need to connect objectives, activities, and assessments, the relationships among instructional components were frequently underdeveloped or insufficiently explicit. A recurring issue involved the formulation of learning objectives that lacked measurable behavioural indicators, complete ABCD components (Audience, Behaviour, Condition, Degree), or clear cognitive targets. Consequently, instructional activities sometimes emphasized lower-order practices despite objectives implying higher-order competencies. In several cases, assessment tasks focused primarily on factual recall or worksheet completion, while learning outcomes emphasized critical thinking or communicative production. These inconsistencies suggest that partial alignment emerged not from the absence of pedagogical understanding but from difficulties in translating abstract alignment principles into technically coherent instructional decisions.

The low-aligned module revealed more fundamental pedagogical fragmentation across instructional components. Learning objectives were ambiguously formulated, instructional activities lacked clear sequencing, and assessment tasks were minimally connected to intended competencies. The module also showed limited evidence of cognitive progression and did not incorporate authentic or performance-based assessment strategies. Rather than functioning as an integrated instructional system, the module reflected a collection of disconnected instructional elements. This finding indicates that while most pre-service teachers had developed a basic understanding of alignment principles, a small number still experienced substantial difficulties in integrating instructional planning, cognitive structuring, and assessment design simultaneously.

Cross-case thematic analysis identified four recurring patterns underlying both alignment and misalignment across the instructional modules. First, structural coherence emerged as the strongest dimension of alignment, particularly in modules employing student-centered instructional models. Second, cognitive progression was frequently present but remained implicit, indicating partial mastery of higher-order instructional design principles. Third, authentic assessment was conceptually recognized but procedurally underdeveloped, especially in relation to rubric construction and measurable performance criteria. Finally, technical precision emerged as the most persistent weakness across all categories of alignment, particularly in the formulation of measurable objectives and explicit cognitive mapping.

The findings indicate that pre-service teachers generally possess a conceptual understanding of constructive alignment and are capable of designing instruction that demonstrates broad pedagogical coherence. However, the analysis also reveals a consistent gap between conceptual alignment and technical implementation. While most modules successfully connected learning outcomes, activities, and assessments at a general level, many failed to operationalize alignment with sufficient specificity, measurability, and procedural clarity. These findings suggest that instructional design competence in pre-service teacher education involves not only understanding pedagogical principles conceptually but also mastering the technical language and precision required to translate those principles into effective instructional practice.

Discussion

The findings indicate that most pre-service teachers were able to demonstrate substantial constructive alignment across learning outcomes, instructional activities, and assessment tasks.

This suggests that the participants had developed a foundational understanding of outcomes-based instructional design and were generally capable of organizing instructional components into coherent pedagogical systems. The strong alignment identified in most modules supports the constructive alignment theory proposed by Biggs & Tang (2011), which argues that meaningful learning occurs when Intended Learning Outcomes (ILOs), Teaching and Learning Activities (TLAs), and Assessment Tasks (ATs) are systematically interconnected. In the present study, alignment was particularly visible in modules employing student-centered instructional approaches such as Project-Based Learning (PjBL) and Discovery Learning, where instructional activities and assessment products were directly linked to expected competencies. This finding reinforces previous studies suggesting that student-centered pedagogies naturally facilitate constructive alignment because they require learners to actively demonstrate targeted knowledge and skills through authentic performance tasks (Buckley et al., 2021; Hamdoun, 2023).

However, although most modules achieved structural coherence, the analysis revealed a persistent gap between conceptual understanding and procedural precision. Many pre-service teachers appeared capable of designing instruction that generally reflected alignment principles, yet they experienced difficulty operationalizing these principles into technically measurable objectives, explicit cognitive mapping, and robust assessment criteria. This finding suggests that alignment competence is multidimensional and develops unevenly. Conceptual coherence may emerge earlier than technical mastery, particularly in teacher education contexts where students are introduced to instructional design principles theoretically but have limited opportunities for repeated guided practice. This interpretation aligns with previous studies emphasizing that instructional design competence requires not only pedagogical understanding but also the ability to translate abstract principles into precise instructional decisions (Darling-Hammond et al., 2017; Lawrence, 2023). Similarly, de Koning et al. (2021) argued that novice instructional designers frequently understand general instructional principles but struggle with technically operationalizing them into measurable and cognitively aligned instructional systems.

One of the most prominent findings concerns the role of student-centered instructional models in strengthening pedagogical coherence. Modules categorized as highly aligned consistently employed instructional approaches that positioned learners as active participants in knowledge construction. These modules commonly integrated collaborative projects, presentations, role-play performances, and problem-solving tasks, all of which reflected authentic learning experiences. This pattern supports constructivist learning theory, which underpins constructive alignment and emphasizes that knowledge is actively constructed through meaningful engagement and interaction (Biggs & Tang, 2011). Previous research similarly demonstrates that project-based and inquiry-oriented pedagogies enhance coherence between instructional objectives, learning activities, and assessment outcomes because students are required to apply knowledge in contextualized situations (Oo et al., 2024; Guaya et al., 2025). Moreover, Hailikari (2022) found that active learning environments strengthened students' perceptions of alignment because learning activities and assessments more transparently reflected intended outcomes. In this regard, the findings suggest that student-centered instructional models may function not merely as teaching strategies but also as practical scaffolds that help pre-service teachers operationalize alignment principles more effectively.

Despite these strengths, assessment design emerged as the weakest dimension of alignment across the modules. Although many participants incorporated authentic and performance-based assessment tasks, the assessment criteria often lacked specificity, measurable indicators, and analytic rubrics capable of comprehensively capturing the intended competencies. This finding reflects broader concerns regarding assessment literacy in teacher

education. Previous studies have consistently reported that pre-service teachers frequently struggle to design assessments that validly measure higher-order learning outcomes and maintain coherence with instructional objectives (Alqassab et al., 2023; Khan et al., 2025). Similarly, Levy-Feldman (2025) emphasized that weak alignment between assessment practices and curriculum goals often leads to superficial evaluation processes that fail to support deep learning. In the present study, assessment tasks were often conceptually relevant but procedurally underdeveloped, indicating that participants recognized the importance of authentic assessment yet lacked sufficient technical expertise to construct rigorous evaluative instruments. This issue is particularly important because assessment functions not only as a measurement tool but also as a central mechanism shaping students' learning behaviours and instructional priorities (Levy-Feldman, 2025).

Another significant finding concerns the implicit rather than explicit integration of cognitive progression. Many modules reflected progression from lower-order to higher-order cognitive processes through the sequencing of learning activities; however, explicit references to Bloom's Taxonomy or cognitive-level indicators were frequently absent. This suggests that pre-service teachers may intuitively understand the importance of cognitive sequencing without fully mastering the technical language required for formal instructional design documentation. Similar findings were reported by Holland (2023), who observed that novice instructional designers often demonstrate implicit pedagogical coherence while lacking explicit articulation of cognitive alignment. de Koning et al. (2021) also noted that cognitive load considerations and instructional sequencing are frequently applied intuitively rather than systematically documented by novice designers. The findings therefore highlight the distinction between tacit pedagogical reasoning and explicit instructional design competence. While intuitive understanding can support instructional coherence, the absence of explicit cognitive mapping may reduce transparency, evaluability, and consistency in instructional planning.

The integration of the Pancasila Student Profile (PSP) further extends the significance of constructive alignment within the Indonesian educational context. Several modules attempted to incorporate PSP dimensions such as collaboration, creativity, critical thinking, and learner autonomy into instructional activities and expected learning products. Although implementation varied in depth and clarity, the findings suggest that pre-service teachers increasingly recognize that instructional alignment should encompass not only cognitive competencies but also broader character and competency-based educational goals. This supports recent studies emphasizing that contemporary curriculum frameworks increasingly integrate character education and holistic learner competencies into instructional planning (Islamiah et al., 2024; Maria et al., 2025). Chotimah et al. (2025) further argued that the PSP framework represents an important shift toward integrating academic achievement with social, ethical, and collaborative competencies in Indonesian education. The present findings therefore suggest that constructive alignment can be contextualized to accommodate national educational priorities and holistic competency development.

The findings also contribute theoretically by repositioning constructive alignment as not only a prescriptive framework for instructional planning but also an evaluative framework for analyzing the pedagogical quality of instructional products. Previous studies have primarily employed constructive alignment as a curriculum development principle or instructional planning model (Hamdoun, 2023; O'Sullivan & Bjørndal, 2024). In contrast, this study operationalized alignment principles into a rubric-based analytical framework capable of systematically identifying patterns of coherence and fragmentation across student-generated instructional modules. This reconceptualization expands the methodological utility of constructive alignment by demonstrating its potential as an evaluative lens for examining instructional quality in teacher education contexts. The findings therefore support recent calls

to reconceptualize alignment not merely as a curriculum design principle but as a broader analytical framework for examining pedagogical effectiveness and instructional coherence (Stamov Roßnagel et al., 2021; O'Sullivan & Bjørndal, 2024).

Pedagogically, the findings imply that instructional design education should place greater emphasis on practice-oriented scaffolding and iterative feedback processes. While pre-service teachers appear capable of understanding alignment conceptually, they require more structured support in translating these understandings into measurable objectives, cognitively aligned activities, and technically rigorous assessment systems. Explicit instruction on objective formulation, Bloom's Taxonomy mapping, and analytic rubric construction may therefore strengthen procedural mastery and improve instructional precision (Anderson & Krathwohl (2001). This implication aligns with Darling-Hammond et al. (2017), who emphasized that professional competence in teaching develops most effectively through guided practice, reflective feedback, and repeated opportunities for authentic instructional design. Likewise, Lawrence (2023) argued that alignment competence should be developed through continuous iterative design experiences rather than solely through theoretical instruction.

The study demonstrates that constructive alignment competence among pre-service teachers is characterized by an important developmental tension between conceptual coherence and technical precision. While most participants successfully developed instructional modules that reflected broad pedagogical alignment, many continued to experience difficulty operationalizing alignment principles explicitly and systematically. These findings underscore the importance of viewing instructional design competence not as a single skill but as a complex integration of pedagogical reasoning, technical articulation, assessment literacy, and contextual responsiveness within contemporary teacher education.

CONCLUSION

This study indicated that the majority of instructional modules developed by pre-service teachers demonstrate significant constructive alignment. This alignment reflects a solid conceptual understanding of how learning outcomes, instructional activities, and assessment tasks function together as an integrated system within outcomes-based education principles. However, there exists a notable gap between this theoretical understanding and its practical application. Many modules fail to exhibit technical accuracy in establishing measurable objectives, accurately mapping cognitive levels, and creating valid assessment rubrics. By utilizing constructive alignment as a rubric-based evaluation principle, this study expands its application from a mere design principle to a systematic tool for assessing instructional quality.

The findings imply that teacher education programs should focus on practice-oriented scaffolding, particularly in goal setting, cognitive alignment, and authentic assessment design to improve both representational and technical skills. Despite limitations concerning sample size and qualitative assessment, the study offers valuable insights for enhancing instructional design training. Future research is suggested to include larger sample sizes, multiple evaluators, and longitudinal analyses of alignment development.

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INFORMED CONSENT STATEMENT

Participation in this study was voluntary. Prior to participation, all participants were provided with clear information regarding the study's objectives, procedures, potential risks, and anticipated benefits. Participants were assured of the confidentiality of their personal information and informed that all data collected would be used solely for research purposes.

They were also informed of their right to withdraw from the study at any time without penalty. Informed consent was obtained from all participants prior to data collection.

DATA AVAILABILITY STATEMENT

The data generated and analyzed in this study are not publicly available because they contain information that could compromise participant privacy and confidentiality. Restricting public access ensures compliance with ethical research principles and applicable data protection regulations. Nevertheless, the dataset may be made available to qualified researchers upon reasonable request for verification or further analysis. Any such request will be reviewed on a case-by-case basis and will require prior approval from the appropriate institutional ethics authority.

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