

Development of the Project-Based Creativity (Pro City) Learning Model to Optimize Science Process Skills of Architecture Students

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ABSTRACT

This study aims to develop the Project-Based Creativity (Pro City) learning model to optimize the science process skills of Architecture students at the Universitas Negeri Gorontalo. The model was developed using a Research and Development (R&D) approach with the ADDIE framework (Analysis, Design, Development, Implementation, Evaluation). The research stages included needs analysis of students and lecturers, model and instructional design, validation by five experts in architecture and education, revisions based on validation feedback, and both limited and large-scale trials involving third-semester students from multiple classes. Data were collected through observations, interviews, and validation sheets and then analyzed using descriptive quantitative methods to assess the model's validity and implementation. The validation results indicated that the Pro City model and its instructional components are feasible for implementation with minor revisions. The implementation phase demonstrated the model's practicality and effectiveness in enhancing students' independence, creativity, and science process skills. This model contributes positively to architectural design

education through a structured and systematic project-based approach.

Keywords: Pro City Learning Model, Science Process Skills, ADDIE Model Development, Architectural Design

INTRODUCTION

Science process skills (SPS) are a critical component of higher education (Harlis & Budiarti, 2017), directly related to students' abilities to observe, analyze, solve problems, and draw logical and scientific conclusions (Budiyono & Hartini, 2016). In the field of Architecture, SPS serves as a fundamental foundation for students to develop designs that are not only aesthetically pleasing but also functional and contextually relevant (Halim, 2024). Unfortunately, the learning approaches applied thus far remain heavily focused on theoretical aspects, with minimal emphasis on practical application and limited opportunities for students to think creatively and critically. The prevailing instructional model positions students as passive recipients of knowledge rather than active participants in constructing understanding through direct experience and exploration. As a result, students' ability to integrate theoretical knowledge with design practice becomes suboptimal, particularly when

confronted with the complexity of ill-defined design problems that require iterative and exploratory approaches.

In architectural education, drawing is not merely a technical activity, but rather a visual representation of cognitive construction (Dulić & Krklješ, 2018). The drawing process reflects a designer's imaginative and intellectual capacity to translate ideas and concepts into communicative visuals (Emmons, 2019). Therefore, drawing skills should be taught not merely as a tool but as a means of thinking and structuring design logic in a systematic way (Żychowska, 2019; Taraskiewicz, 2021). The Architectural Design 1 course, which serves as students' initial foundation in the design world, strategically shapes these essential skills. However, observations indicate that the effectiveness of learning in this course remains suboptimal. Over the past three academic years, student failure rates in this course have been notably high—45% in the 2020/2021 academic year, 40% in 2021/2022, and rising to 55% in 2022/2023. This indicates that the current learning model has not been effective in accommodating the need for active, contextual learning that fosters the development of higher-order thinking skills.

One learning approach that has been increasingly adopted in higher education is Project-Based Learning (PjBL) (De los Ríos-Carmenado et al., 2015; Leal Filho et al., 2016; Žerovnik & Nančovska Šerbec, 2021; Kunusa et al., 2023). This model emphasizes project-based learning, which requires students to actively engage in exploration, investigation, collaboration, and the creation of tangible products (Nayak et al., 2024). PjBL encourages students to engage with authentic problems and seek solutions through information gathering, analysis, and the creative testing of ideas (Barber et al., 2015). In developed countries such as Finland and the United States, PjBL has become a primary instructional model for fostering 21st-century skills, including critical thinking, communication, collaboration, and creativity (Pietikäinen et

al., 2017; Martinez, 2022). Nevertheless, implementing PjBL in architectural education has not yet been fully structured to foster student creativity comprehensively. The learning process still tends to focus on the project's final outcome rather than on the thinking process and creative development involved in formulating design ideas.

In this context, there is a need for a learning model that not only adopts a project-based approach but also integrates creativity development as a key component of the learning process. Therefore, the development of the Project Based Creativity (ProCity) learning model is highly relevant in addressing this need. ProCity combines the strengths of PjBL with a specific emphasis on fostering students' creativity in formulating, developing, and representing design ideas in an original and meaningful way. This model positions students as the central agents in the learning process, encouraging them to think reflectively, engage in design experimentation, and produce outcomes that are not only functional but also innovative. Through this approach, students' science process skills are expected to develop more optimally as the learning occurs in contextual, challenging, and collaborative environments.

In its design process, the Pro City model will adapt constructivist learning principles, which emphasize the active role of students in constructing knowledge through meaningful learning experiences. Vygotsky (1997) highlights the importance of social and cultural interaction in the learning process through the Zone of Proximal Development concept. This forms the foundation for developing a collaborative learning environment, where students learn from the instructor and their peers through discussions, teamwork, and the presentation of design outcomes. In addition, Pro City is designed to provide appropriate guidance through the active involvement of lecturers as facilitators rather than mere instructors. An ideal student-to-teacher ratio, similar to that of studio-based learning systems in architectural education, is maintained to

ensure effective supervision and feedback throughout the learning process.

Based on the above explanation, the main problem addressed in this study is the suboptimal implementation of a learning model capable of holistically developing science process skills among architecture students. This is primarily due to the lack of innovative and structured approaches in stimulating student creativity. Therefore, the research problem in this study is focused on the development of the Project Based Creativity (Pro City) learning model, aimed at optimizing the science process skills of students in the Architecture Study Program. This study is directed toward designing, implementing, and evaluating a learning model that is valid and practical and effective in enhancing students' abilities to think critically, creatively, and scientifically through a project-based learning approach integrated with creativity development.

MATERIALS & METHODS

Research Setting and Duration

This study was conducted in the Architecture Study Program, Faculty of Engineering, Universitas Negeri Gorontalo, in the Studio Gambar Laboratory. The research subjects were third-semester students during the 2023/2024 to 2024/2025 academic years.

Type and Approach of the Study

This research is categorized as a development study (Research and Development) to develop the Project Based Creativity (Pro City) learning model to optimize science process skills. A descriptive quantitative approach was employed to produce a viable instructional model.

The development model refers to the ADDIE framework (Analysis, Design, Development, Implementation, Evaluation). This model was selected because it provides a systematic and structured framework for developing learning products that align with the characteristics and needs of students.

Model Development Procedure

The development of the Project-Based Creativity (Pro City) learning model was carried out using the ADDIE framework (Branson et al., 1975), which consists of five main phases:

1. Analysis Phase

In this phase, the needs and characteristics of students were identified, with issues encountered in the learning process at the Studio Gambar Laboratory. Data were collected through observations and interviews with lecturers teaching the Science and Technology course. The analysis revealed the need for a learning approach that could optimize students' science process skills, particularly in the areas of problem-solving, planning, and decision-making.

2. Design Phase

Based on the analysis results, the design phase systematically outlined the steps for developing the Pro City learning model. Activities in this stage included formulating learning objectives, designing project-based learning scenarios, and developing instructional tools such as the Semester Learning Plan (RPS), Modules, Student Worksheet (LKM), and science process skills assessment tools. This stage's outputs were conceptual and served as the foundation for the next phase of product development.

3. Development Phase

The development stage began after designing the learning model, including defining its syntax/steps. It involved:

- validation of the model and learning tools by experts, followed by revisions,
- assessment of practicality, and
- evaluation of effectiveness through limited and broader trials. The limited trial was conducted with third-semester students from Architecture Class A, and the broader trial with students from Classes B and C.

a) Design Validation

Five expert validators reviewed the learning model and tools, including the

learning model itself (content and construct validity) and its components: lesson plan (RPS), learning module, student worksheet (LKM), and science process skills test.

b) Design Revision

Based on expert feedback, revisions were made to refine the model into an effective, practical, and applicable Procity-based learning model. The revised model was deemed suitable for product testing.

c) Product Testing

Product testing aimed to gather responses, feedback, and reactions from students and observers. It included:

- 1) Trial Design: Conducted in stages—limited and broader trials—to gather data for final revisions.
- 2) Test Subjects:
 - Validators: Lecturers from Universitas Negeri Gorontalo, based on their expertise.
 - Limited trial: 25 third-semester students from Architecture Class A.
 - Broader trial: 30 students each from Architecture Classes B and C.

4. Implementation Phase (Trial and Implementation)

At this stage, the design that had been tested—both in limited and broader trials—was implemented with students from the Architecture Study Program, Class D, and the Vocational Program. The material was delivered using the newly developed model/method. Following the implementation, an initial evaluation was conducted to provide feedback on the application of the learning model.

5. Evaluation Phase

A comprehensive evaluation was conducted across all development stages, from analysis, design, and development to classroom implementation. This evaluation aimed to assess the model's feasibility, the practicality of its implementation, and its effectiveness in enhancing students' science process skills. Evaluation data were obtained

through observations, user feedback (from both students and lecturers), as well as assessments provided by expert validators.

Data Collection Technique

Data collection in this study was conducted to support the analysis of the validity, practicality, and effectiveness of the Pro City model and its instructional components. The data types collected included the validity of the learning model and its components, such as the RPS, LKM, and science process skills tests. Additionally, data were gathered on the implementation of the learning model, student activities during the learning process, and student responses to the use of the Pro City model. To obtain these data, several instruments were used, as follows:

1) Validation Instrument for the Learning Model Book

Validation was carried out by subject-matter experts using a validation sheet that assessed both the content and construct aspects of the Pro City model. Indicators included the alignment with supporting theories, clarity of objectives, the feasibility of the instructional syntax, and the quality of lecturer–student interaction in supporting the development of science process skills.

2) Validation Instrument for Instructional Tools

- Semester Learning Plan (RPS): The assessment covered aspects such as structure, completeness of learning outcomes, content relevance, learning activities, assessment methods, learning resources, time allocation, and language use.
- Pro city. Learning Module: Evaluated based on structure, content quality, and alignment with the curriculum and the Pro City-based learning model.
- Student Worksheets (LKM): Assessed for clarity of instructions, goal alignment, presentation structure, and support for student creativity and exploration.

- Science Process Skills Test: Reviewed in terms of the construct (objectives, instructions, test blueprint, and scoring guidelines) and content (alignment of indicators, material, and question types with targeted science process competencies).

Data Analysis Technique

The data analysis in this study employed a quantitative descriptive approach. This technique aimed to describe the level of validity of the Project-Based Creativity (ProCity) learning model and its instructional components based on expert (validator) assessments. The analysis procedure began with compiling all assessment results provided by the validators. Each validator assigned scores to predetermined aspects listed in the validation sheets, covering both the learning model and its supporting components, such as the Semester Learning Plan (RPS), Lesson Plan (SAP), teaching materials, instructional media, Student Worksheets (LKM), and the science process skills test instrument.

1) Model Validity Data Analysis

The validation results of the Pro city learning model and its instructional components were analyzed through the following steps:

- Recapitulating expert assessment results, calculating the mean score, and the average percentage of expert assessments for both the learning model and its components using the formula by Arikunto (2002):

$$X = \frac{\sum x}{n}$$

Details:

X = Average score

$\sum x$ = Total score from all validators

n = Number of validators

- Determining the validity category for each criterion by matching the average validation percentage with predetermined validity categories. The

validity criteria are based on Ratumanan (2003) as shown below:

Table 1. Validity Criteria

No	Percentage	Category
1	85% – 100%	Very Valid (VV)
2	69% – 84%	Valid (V)
3	53% – 68%	Fairly Valid (FV)
4	21% – 36%	Not Valid (NV)

Source: Ratumanan (2003)

A learning model is considered to have an adequate level of validity if it falls at least within the "Valid" category.

2) Model Implementation Data Analysis

The implementation of the learning model refers to the extent to which the learning syntax is achieved, supported by an appropriate learning environment. Learning activities follow the syntax of the Pro city learning model. Observers rated the implementation on a scale of 5 (very good) to 1 (very poor).

The steps in analyzing the implementation data include:

- Recapitulating the implementation observation results from three observers using the formula:

$$\%Implementation = \left(\frac{\text{Number of implemented steps}}{\text{Number of planned steps}} \right) \times 100\%$$

- Calculating the average implementation percentage with the formula:

$$\%Average = \left(\frac{\text{Sum of observer percentages (1, 2, and 3)}}{3} \right)$$

The implementation is considered practical if it meets the criteria proposed by Sugiyono (2009), as shown below:

Table 2. Implementation Level Criteria

No	Percentage	Category
1	86 – 100	Very Good
2	75 – 85	Good
3	66 – 74	Fair
4	56 – 65	Poor
5	0 – 55	Very Poor

Source: Sugiyono (2009)

The Pro city virtual lab-based inquiry learning model is considered practical if the implementation achieves at least a “Good” rating.

RESULT AND DISCUSSION

Development Outcomes of the Project-Based Creativity (Pro City) Learning Model

The findings of this study focus on the development of the Project Based Creativity (Pro City) learning model as an innovative approach to optimize the science process skills (SPS) of Architecture Study Program students, particularly in the Anthropometric Drawing Studio course, which serves as an integral component of Architectural Design I. The development of the Pro City model followed a systematic approach based on the ADDIE instructional design framework (Analysis, Design, Development, Implementation, and Evaluation). Each phase of this process was carefully designed to address the contextual learning needs, respond to the identified instructional challenges, and ensure that the model enhances students’ active engagement in the learning process in a creative and application-oriented manner.

Analysis Phase

In the analysis phase, a series of activities were carried out, including learning needs analysis, student characteristics analysis, task analysis, concept analysis, and learning objectives analysis. One of the key findings from this stage was that the learning process in the Anthropometric Drawing Studio course has remained predominantly theoretical and has provided limited opportunities for contextual, hands-on learning experiences. Based on an evaluation using case study questions and multiple-choice assessments, it was found that many students had not yet demonstrated optimal competency achievement—particularly in their ability to integrate anthropometric data into functional spatial design. This condition reveals a gap between the intended learning outcomes and the actual instructional

approach implemented. Therefore, an intervention in the form of a more adaptive, participatory, and problem-solving-oriented learning model is deemed necessary.

The literature review analysis found that the learning outcomes for architecture students must refer to four main domains: attitude, knowledge, general skills, and specific skills, as stipulated in Permendikbudristek No. 53 of 2023. These elements serve as the foundation for designing a curriculum that aligns with the Indonesian Qualifications Framework (KKNI). However, in the actual learning process, it has not been fully evident that students are able to develop science process skills such as critical thinking, observation, data interpretation, and comprehensive problem-solving. This is supported by interviews with course instructors and direct classroom observations, which revealed that students often struggle to connect theoretical concepts with practical applications and are less capable of presenting creative and contextual design solutions. This condition reinforces the urgency to develop a learning model that actively engages students in meaningful learning activities.

Concept analysis was then conducted to determine the learning materials to be developed within the framework of the Pro city learning model. These materials include the fundamentals of architectural drawing, notation and standardization, floor plan design based on spatial anthropometry principles and human activities, as well as brainstorming activities for design development. The analysis revealed that students’ mastery of these concepts remains limited, particularly in creatively integrating anthropometric data into functional design solutions. Therefore, the Pro city model is designed to integrate the core principles of Project-Based Learning (PjBL), such as real-world problem-solving, collaboration, and the creation of tangible products, while emphasizing the development of architectural creativity. This means that students are not only taught to produce technically standardized drawings but are

also challenged to develop innovative design solutions that are responsive to human needs as spatial users.

Furthermore, a learning objective analysis was conducted to ensure that the development of the Pro city model aligns with the graduate competencies established by the study program. The learning objectives were systematically formulated based on the curriculum and national higher education standards, encompassing students' abilities to identify, analyze, and design simple building layouts grounded in anthropometric principles and human activity. In addition, students are also expected to be able to present their design outcomes communicatively and professionally. These objectives then serve as the foundation for designing a learning model that enhances conceptual understanding and develops students' technical abilities and soft skills, such as teamwork, communication, and creativity. Therefore, the Pro city approach is highly suitable, as it provides space for students to learn through direct experience, idea exploration, and critical reflection on the design process.

Thus, the analysis stage in developing the Pro city learning model provides a comprehensive overview of the challenges and opportunities in teaching Anthropometric Drawing Studio. By strengthening the alignment between instructional content, learning objectives, and contextual teaching methods, the Pro city model was designed as a solution to address the inadequate mastery of science process skills among architecture students. This model is expected to create a dynamic, creative, and professionally relevant learning environment aligned with the demands of the architectural field while also addressing the core research problem: how to develop an effective instructional model to optimize architecture students' science process skills. This analysis phase serves as a crucial

foundation for the subsequent stages of development, in which the model's design, implementation, and evaluation will be systematically aligned with the identified needs and contextual factors of the learning environment. The proposed model is expected to foster a dynamic, creative, and industry-relevant learning environment that aligns with the professional demands of architectural practice. It also aims to address the central research question of how to develop an effective instructional model to optimize architecture students' science process skills. The analysis phase serves as a critical foundation for the subsequent development stages, where the design, implementation, and evaluation of the model will be guided by the in-depth identification of learning needs and contextual factors.

Design Phase

The design phase aims to produce an initial framework for the Project Based Creativity (Pro city) instructional model, which adapts the Project Based Learning (PjBL) approach with a specific emphasis on creativity, contextual learning, and collaboration. This stage directly addresses the research question concerning how the Pro city model can be designed to align with the learning demands of the Anthropometric Drawing Studio within the Architectural Design 1 course. It also explores how supporting materials can be developed to enhance the effectiveness of project-based learning grounded in real-world applications.

a. Pro city Learning Model Syntax Design

The syntax of a learning model serves as a systematic framework for instructional implementation. The Pro city model's syntax is specifically designed to stimulate students' creative thinking by resolving real-world, phenomenon-based problems. The structure adapts and expands upon the stages of the conventional Project Based Learning (PjBL) model to better suit the application within architectural studio settings.

Table 3. Syntax of the Pro city Learning Model

No	Conventional PjBL Syntax	Pro city Syntax (Project Based Creativity)
1	Present the problem to students	Present the Phenomenon
2	Organize students for research	Formulate the Problem
3	Guide individual and group investigations	Gather Information
4	Develop and present artifacts and exhibits	Design Experiments (incorporating diverse perspectives)
5	Analyze and evaluate the process	Monitor Project Design
6	-	Present and Analyze Data
7	-	Draw Conclusions

Source: Processed Data, 2025

This syntax was developed by considering the characteristics of architecture students, who operate within the realm of andragogy, and by aligning it with real-world project-based learning contexts. Each stage is designed to progressively facilitate students' creativity—from presenting real-life spatial phenomena, formulating problems based on observation, collecting anthropometric data, exploring design ideas, and formulating creative solutions and conclusions relevant to professional architectural practice. Thus, the Pro city syntax emphasizes not only the final product but also the cognitive process and collaborative efforts of students throughout the learning experience.

b. Instructional Support System for the Learning Model

A comprehensive and integrated support system is essential to ensure the successful implementation of the Pro City learning model. This system includes the following:

1. Semester Learning Plan (RPS): Developed based on the *Merdeka Belajar* approach and student-centered learning principles, the RPS integrates the Pro City syntax across three key sessions. Each session is designed to encourage idea exploration and student innovation.
2. Learning Modules: The modules are thematically organized, grounded in local and global contexts, and aim to support the achievement of cognitive, affective, and psychomotor competencies. Learning materials are drawn from textbooks and case studies, academic journals, and contemporary architectural practices.
3. Instructional Media: Primary media include interactive presentations and

educational videos guided by the TPACK framework. 3D simulations, design animations, and anthropometric visualizations are employed to enhance students' understanding and creative capacity.

4. Student Worksheets (LKM): The LKMs serve as exploratory tools aligned with the Pro City syntax. Equipped with reflection sections, concept maps, process documentation, and formative assessment rubrics, they facilitate critical and creative thinking.
5. Evaluation Instruments: Both formative and summative assessments are employed to measure instructional impact and learning progression. Various tools such as objective tests, project rubrics, and process skill observation sheets are utilized to provide a holistic evaluation of student performance.

Development Phase

a. Validity Analysis

1) Validation of the Project-Based

Creativity (Pro city) Learning Model

At this stage, the validity analysis was conducted in two parts: validation of the Pro city learning model and validation of the accompanying learning tools. The validation process involved three expert validators specializing in education and vocational studies. The content validation focused on key elements of the model, including the supporting theoretical framework, instructional objectives, the learning syntax (i.e., procedural steps), and the learning environment that supports the implementation of the model. The validators

rated the developed model in the “good” category.

The content validity of the developed learning model refers to the definition proposed by Nieveen (2007), which states that a learning model is considered to have good content validity if its components are based on a strong theoretical rationale.

Meanwhile, construct validity was assessed by evaluating the model’s design’s logical consistency and its components' internal coherence. The results of the content and construct validity assessments for the Pro city learning model are briefly presented in Table 4 and Table 5, with the average scores illustrated in Figure 1.

Table 4. Expert Assessment of the Content Validity of the Pro city Learning Model

No.	Assessment Aspect	Average Score (3 Validators)	Percentage of Agreement (%)	Description
1.	Supporting Theory of the Model (max score 4)	12.00	100.00%	VV
2.	Goal Rationality (max score 4)	12.00	100.00%	VV
3.	Learning Syntax (max score 4)	11.00	91.67%	VV
4.	Learning Environment (max score 4)	11.00	91.67%	VV
5.	General Validation Conclusion (max score 4)	12.00	100.00%	VV
Average Score		11.60	96.67%	VV

Source: Processed Data, 2025
Details: VV (Very Valid), V (Valid)

Table 4 presents the results of the content validity assessment, which includes the "Very Valid" category, with an average

achievement score of 96.67%. Meanwhile, the construct validity results are presented in the following table:

Table 5. Construct Validity Assessment of the Pro city Learning Model

No.	Assessment Aspect	Average Score (3 Validators)	Percentage of Agreement (%)	Description
1.	Alignment between model stages and intended goals is not contradictory (max score 4)	12.00	100.00%	VV
2.	Relevance of supporting theories to the characteristics of the anthropometry studio course in Architectural Design I	12.00	100.00%	VV
3.	Comprehension of principles from supporting theories aligns with the objectives and characteristics of the anthropometry studio content without contradiction (max score 4)	11.00	91.67%	VV
4.	Internal coherence among each learning stage within the developed model (max score 4)	12.00	100.00%	VV
5.	Interrelated lecturer and student activities in each stage of the developed model (max score 4)	12.00	100.00%	VV
6.	Use of learning resources supports the achievement of objectives (max score 4)	12.00	100.00%	VV
7.	Interaction patterns between lecturers and students are mutually supportive (max score 4)	11.00	91.67%	VV
8.	Lecturer behavior in providing motivation and guidance to students is reflected across the stages of the developed learning model	12.00	100.00%	VV
Average Score		11.75	97.92%	VV

Source: Processed Data, 2025
Details: VV (Very Valid), V (Valid)

Tables 4 and 5 demonstrate high content levels and construct validity for the Procity learning model. The content validity findings demonstrate that the key characteristics of the Procity model, namely the supporting theoretical foundation, goal rationality, instructional syntax, and learning

environment, are well established and coherent. Meanwhile, the construct validity assessment highlights strong internal consistency, reflected in the alignment between the instructional stages and the interrelated components of the learning model.

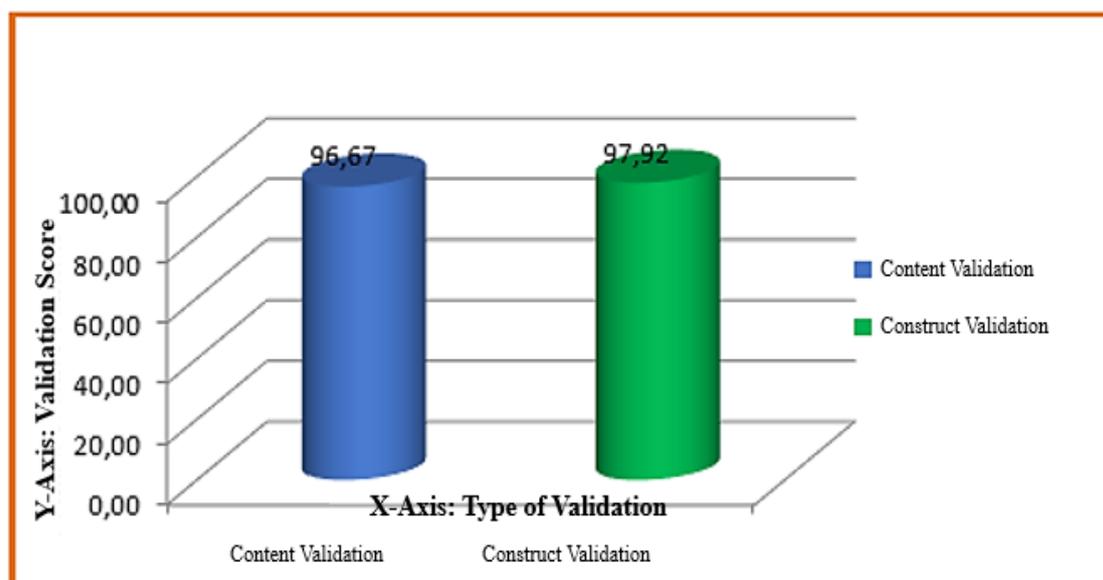


Figure 1. Bar Chart of the Average Validity Scores of the Procity Learning Model

Figure 1 presents a bar chart illustrating the average scores of the validity assessments for the Pro city learning model. The chart shows that the content validity, represented by the blue bar, reached 96.67%, categorized as very valid. Meanwhile, the construct validity, represented by the green bar, reached 97.92% and was also categorized as very valid.

2) Reliability of the Validation Instrument for the Project-Based Creativity (Procity) Learning Model

The reliability results of the Pro city learning model validation instrument are presented in Table 6.

Table 6. Reliability Analysis of the Validation Instrument for the Pro city Learning Model

No.	Assessment Aspect	Percentage of Agreement	Reliability Category
1.	Model Relevance (Content Validity)	0.867	Very High
2.	Model Consistency (Construct Validity)	0.917	Very High

Source: Processed Data, 2025

Table 6 shows that the reliability of the learning model falls into the very high category, both in terms of relevance and consistency. These findings indicate that all validators' assessments of the Pro city learning model are reliable and support its application, particularly in the

anthropometry drawing studio course within the Architectural Design 1 subject for architecture students. Therefore, the developed Pro city model is feasible to be tested further to examine its practicality and effectiveness.

3) Validation of the Semester Learning Plan (RPS)

design studio course. The results are presented in Table 7.

Expert validators conducted the validation assessment of the RPS for the architectural

Table 7. Expert Assessment Results of the RPS for the Procity Learning Model

No.	Assessed Aspect	Percentage of Agreement (%)	Description
1.	RPS Identity	100.00%	VV
2.	Formulation of Learning Outcomes	100.00%	VV
3.	Course Content	100.00%	VV
4.	Learning Activities	98.61%	VV
5.	Learning Outcome Assessment	95.83%	VV
6.	Learning Resources	100.00%	VV
7.	Time Allocation	83.33%	VV
8.	Language Usage	100.00%	VV
Average		97.22%	VV
Reliability		0.926	High Reliability

Source: Processed Data, 2025
 Details: VV (Very Valid), V (Valid)

Table 7 presents the expert assessment of the RPS and the course session plan for the anthropometric drawing studio course within Architectural Design 1. The evaluation yielded high scores across all assessed components. The average percentage score of 97.22% falls into the very valid category, indicating that the instructional design

outlined in the RPS is well-aligned with the Procity learning model and is valid for implementation in the anthropometric drawing studio course for Architecture students. Furthermore, the instrument's reliability score was 0.926, placing it in the category of high reliability.

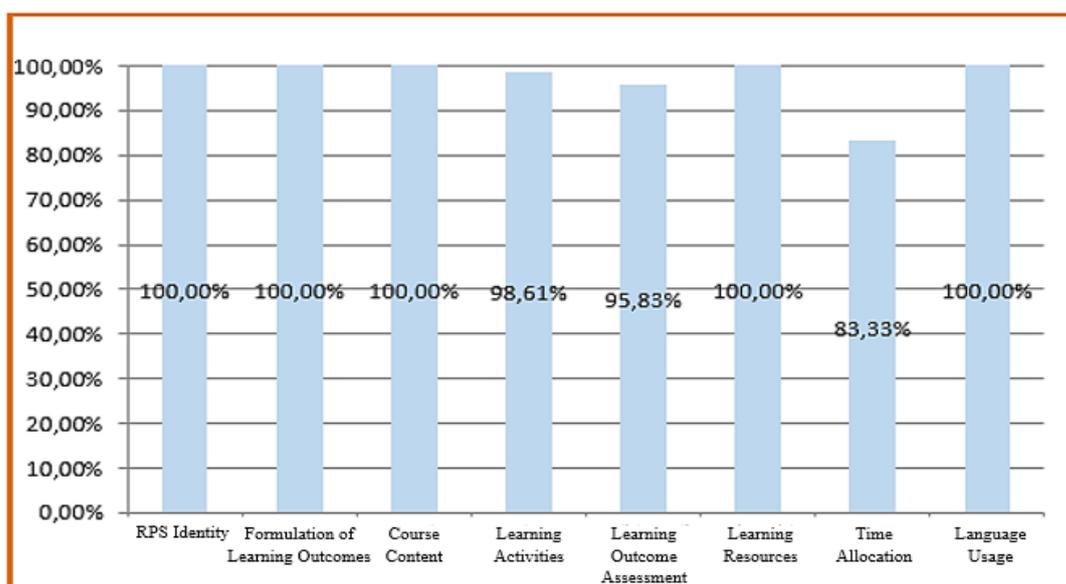


Figure 2. Average Expert Score on the RPS of the Pro city Learning Model

Figure 2 presents the average expert scores for the Semester Learning Plan (SLP) and session plans (SAP) of the Procity learning model, specifically within the anthropometric drawing studio course in the

Architectural Design 1 curriculum for Architecture students. All evaluated SLP and SAP components were rated in the “very valid” category. This indicates that both the SLP and SAP serve as essential supporting

tools in enhancing the development of the Project-Based Learning (PjBL) model into the more creativity-oriented Procity model, thereby optimizing project-based learning implementation.

4) Expert Assessment of Supporting Instruments for the Pro city Model

As part of the development process for the Project-Based Creativity (Procity) learning model, validation was conducted on supporting instruments, including student response questionnaires and observation sheets for model implementation and student activities. This validation aimed to ensure that the instruments used are appropriate and relevant for measuring the practicality and effectiveness of the model. The validation

process involved experts with competencies in architectural education and instructional development.

Three expert validators validated the student response questionnaire. All three evaluators concluded that the instrument was suitable for use without requiring revision (V1), indicating that the questionnaire met the necessary content, construct, and language criteria. Meanwhile, the observation sheets for model implementation and student activity were validated by five expert validators. All experts confirmed that both observation sheets were suitable for use (SU), and no further revisions were needed. The expert evaluations for these three instruments are summarized in Table 8 below:

Table 8. Summary of Validation Results for Supporting Instruments of the Procity Model

No	Instrument Name	Number of Validators	Validation Result	Feasibility Category
1	Student Response Questionnaire	3 experts	V1, V1, V1	Suitable for use without revision
2	Model Implementation Observation Sheet	5 experts	SU, SU, SU, SU, SU	Suitable for use
3	Student Activity Observation Sheet	5 experts	SU, SU, SU, SU, SU	Suitable for use

Details: V1 = Suitable for use without revision SU = Suitable for use

The consistent validation results from experts indicate that all supporting instruments possess adequate quality in measuring student responses and engagement and implementing the Pro city model in practice. This provides a critical foundation for the next stages in the model development process, namely pilot testing and broader implementation. The acceptance of these instruments by the validators further reinforces the study's internal validity and ensures the accuracy of data to be collected during the learning model's practicality and effectiveness testing phases.

Implementation Phase

The implementation stage aims to examine the practicality of the Pro city learning model through direct classroom application. The

trial was conducted across two study programs, namely:

1. Undergraduate students (Class D) from the Architecture Study Program, Faculty of Engineering, Universitas Negeri Gorontalo (18 students), and
2. Students from the Applied Bachelor's Program (D-IV) in Building Architecture within the Vocational Program at Universitas Negeri Gorontalo (11 students).

The model was implemented throughout three class meetings in the Architectural Design Studio course, focusing specifically on anthropometric drawing. Practicality was assessed based on the execution of the model's syntax, classroom atmosphere, and time management. The combined observation results from all three classes are presented in Table 9.

Table 9. Observation Results of the Pro city Learning Model Implementation Across Three Classes

No	Aspect	Item	Meeting 1	Meeting 2	Meeting 3	Average
1	Syntax Implementation	Introduction Phase	96.67%	98.33%	98.33%	97.78%
		Implementation Phase	90.30%	93.34%	93.34%	92.33%
		Conclusion Phase	90.00%	95.00%	95.00%	93.33%
	Subtotal Average		92.32%	95.56%	95.56%	94.48%
2	Classroom Atmosphere		85.00%	90.00%	90.00%	88.33%
3	Time Management		100.00%	100.00%	100.00%	100.00%
	Overall Average		92.44%	95.19%	95.19%	94.27%
	Criteria		Very Good	Very Good	Very Good	Very Good

Source: Processed Data, 2025

Based on the results presented in Table 9, the practicality of the Pro city learning model falls into the 'very good' category. The implementation of the instructional phases showed consistent improvement across meetings, indicating that both lecturers and students became increasingly accustomed to and comfortable with the creative project-based learning approach.

Specifically, implementing the Pro city learning model demonstrated highly positive outcomes in the architectural design learning process. The introduction phase of the model was consistently well-executed, reflecting a deep student understanding of the problems introduced in each session. A significant improvement was observed during the implementation phase, which emphasized idea exploration and data processing. However, further guidance is still needed to enhance student's ability to present their ideas from multiple perspectives in greater depth. Over time, the progressively improving classroom atmosphere indicated active student engagement and a growing collaborative spirit in discussions and group work. Moreover, time management during the implementation of the learning activities proceeded optimally without significant obstacles. Overall, the Pro city learning model proved to be both easy to implement and effective in fostering students' independence, creativity, and critical thinking skills in the context of architectural design courses.

Evaluation Phase

The evaluation stage was conducted to ensure that the Pro city learning model and its supporting instruments fully met the validity, practicality, and effectiveness criteria in enhancing students' process skills in the anthropometric drawing studio.

The Pro city learning model and its instructional tools were validated by five expert validators with backgrounds in architectural education, instructional design, and educational evaluation. The aspects evaluated included the alignment of the model's syntax with learning objectives, the completeness of instructional tools such as student worksheets (LKM), media, and assessment instruments, as well as the coherence between learning activities and the reinforcement of students' process skills. The validation results indicated that the Pro city model and its instructional tools were considered valid and appropriate for learning. The suggested revisions were minor, involving adjustments between stages of the syntax to enhance the flow of students' creative thinking and strengthen the aspects of reflection and visual analysis to support students' observational skills and idea synthesis.

The model was then revised in a limited scope to ensure that all components effectively support a project-based learning approach that is creative, structured, and aligned with the demands of the architectural field. This evaluation demonstrates that the Pro city learning model is practical and provides a clear direction for enhancing the

quality of architectural design studio instruction.

CONCLUSION

The findings of this study indicate that the Pro city learning model is both effective and practical for implementation in anthropometric drawing studio courses within the Architecture and D-IV Building Architecture programs at Universitas Negeri Gorontalo. The model successfully enhances students' independence, creativity, and critical thinking skills through a structured, project-oriented instructional framework. During implementation, the model demonstrated high procedural execution, a conducive classroom atmosphere, and optimal time management, all supporting an active and collaborative learning process. Furthermore, validation by experts and the implementation of the learning model in lectures, confirmed that the Pro city learning model and its instructional components are appropriate for use, with only minor revisions recommended for refinement. These revisions strengthen the learning syntax flow and enhance the reflection and visual analysis components, further optimizing students' scientific process skills. Thus, the Pro city model meets the criteria for validity and practicality and holds significant potential for improving the quality of learning and student outcomes in architecture.

Declaration by Authors

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