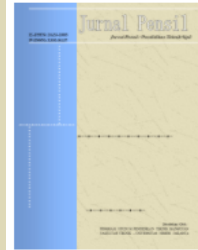


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RELEVANCE OF BUILDING ENGINEERING EDUCATION CURRICULUM TOWARDS SKKNI BUILDING AND CONSTRUCTION MANAGEMENT COMPETENCIES

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Abstract

Indonesia's rapidly growing construction industry is a key economic driver, presenting both challenges and opportunities for graduates of the Building Engineering Education Program. Higher education plays a crucial role in developing competent human resources with the relevant knowledge, skills, and expertise to meet industry needs. This study maps the qualifications of technicians and analysts based on the Indonesian National Work Competency Standards (SKKNI) in the construction sector and analyzes the alignment of competency units with Building Engineering Education State University of Jakarta course outcomes. The analysis of SKKNI data from 2024 found that out of 71 job levels in the building subclassification, 14 are for technicians or analysts at KKNi levels 4 to 6, but only 10 have detailed SKKNI documents. In the construction management classification, there are 39 job levels, with 16 for technicians/analysts, all with detailed SKKNI documents. The analysis indicates that 11 job levels are relevant to Building Engineering Education course outcomes, while two are not. Specifically, several job levels in both subclassifications are rated from Relevant to Very Relevant. To address curriculum gaps, recommendations include strengthening the existing curriculum and adding new courses. This study aims to provide a foundation for curriculum revitalization, ensuring Building Engineering Education graduates are competitive in the labor market and meet the evolving needs of the construction industry.

P-ISSN: [2301-8437](https://doi.org/10.21009/jpensil.v13i3.48949)

E-ISSN: [2623-1085](https://doi.org/10.21009/jpensil.v13i3.48949)

ARTICLE HISTORY

Accepted:

11 Agustus 2024

Revision:

20 September 2024

Published:

30 September 2024

ARTICLE DOI:

[10.21009/jpensil.v13i3.48949](https://doi.org/10.21009/jpensil.v13i3.48949)



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Keywords: Relevance, Competencies, Curriculum, Building Engineering Education

Introduction

The Indonesian construction industry is one of the rapidly growing sectors and is a major driver of Indonesia's economic growth. Developments in the growth of the construction industry provide challenges and opportunities for higher education graduates, including the Building Engineering Education Study Program. Higher education has an important role in forming competent human resources in their fields to produce graduates who are competitive and competent according to the needs of the industrial world (Kementerian PUPR, 2022). The Competence can be conceptualized from two basic meanings, the first of which includes the amount of having knowledge, skills, and work attitudes (Choirunnisa, Ifa; Muladi, Muladi; Devi, 2018; Falakh, 2022; Menteri Ketenagakerjaan Republik Indonesia, 2020; Samsul et al., 2023; Wibowo et al., 2022) that enable professionals to take the most appropriate in each case and decision in every situation. The second includes the characteristics and quality of individuals to carry out effective activities that explain the added value of professionals into practice and outcomes (Asfiyanur et al., 2018). For this purpose, it is necessary to identify current and future student skills that are needed for jobs in the construction sector.

In accordance with the Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 73 of 2013 concerning the Implementation of the KKNI in the Field of Higher Education, the preparation of a study program curriculum that refers to the KKNI in the field of higher education with the aim of higher education outcomes, especially in the Building Engineering Education Study Program, to obtain recognition of the qualifications of graduates of certain types of education from universities (Muhammad & Ariani, 2020). In addition, as an effort to realize one of the main tasks of universities to improve the quality and relevance of higher education by making changes with the harmonization of Key Performance Indicators (IKU). There are 8 (eight) main indicators of performance measurement set by the Director General of Higher Education, which are the basis for the transformation of higher education institutions (Mancotywa, 2023). One of the performance indicators is IKU 1, which is related to graduates getting decent jobs. Higher education institutions need to equip students with skills that have a selling value in the industry. The main requirement for achieving competent working graduates is to determine the development of skills requirements expected by the industry (Akyazi et al., 2020).

The curriculum is developed based on the graduate profile and learning outcomes. One of the important criteria of the KKNI-based curriculum is that it is developed independently by the study program by referring to the established requirements. However, the data from the BANPT reviewer shows that from the 27 study programs visited and observed in many parts of Indonesia, only five have developed their curricula based on the KKNI patterns and standards, although they were still not perfect (Muhammad & Ariani, 2020). The curriculum mapping is also based on the study program's achievements, specifically in the fields of structure, surveyor, and construction management (Building Engineering Education Study Program, 2024).

Based on the graduate profile of Building Engineering Education, graduates are expected to be able to work as (1) Teachers in the field of Building Engineering expertise who are able to develop a teaching system for the field of Building Engineering expertise in vocational schools and formal and non-formal education; (2) Personnel who can work in the field of construction services; and (3) Entrepreneurs with a background in Building Engineering knowledge. Therefore, Building Engineering Education graduates are required to be able to teach the field of Building Engineering expertise at the operator and technician/analyst levels. In addition, one of the study program's learning achievement targets is to have basic engineering competencies and the basics of building engineering, where, based on the level of mastery, it can be classified at KKNI level 4 and able to solve building engineering problems to support the learning process according to planning based on the latest science and technology which can be classified at level 5 (Sailah, I., et al., 2015; Suyono et al., 2023). At the same time, Building Engineering Education, as a bachelor's graduate, can be classified at KKNI level 6.

Data on graduates of Building Engineering Education obtained through tracer studies shows a high number of graduates who still need to work, namely 51% of the 2024 Tracer Study data. This issue is due to the competency gap indicated by the misalignment of competencies needed by the construction industry with the competencies possessed by prospective graduates of construction service colleges (Kementerian PUPR, 2022). If someone is said to be competent in their field, they must have aspects of work attitude that are relevant to the needs of the business world and the industrial world (Oroh, 2023). Therefore, there is a challenge to meet the demand for industry skills, so programs in colleges are urgently evaluated to address this problem and ensure that programs remain aligned with the industry (Nkwanyane, 2023).

The unemployment rate of graduates from vocational education is still high, and some of which are the quality of graduates from vocational education still needs to be improved. It has an impact on the productivity of the Indonesian workforce, which is relatively low (Utomo, 2021); there is a mismatch between education and the need for labour market skills, which is still high, especially for workers with higher education (Disas, 2018). Several new things added to the Guide published in 2022 are the curriculum cycle, curriculum models and designs, and alignment between the KKNI and CPL concepts (Santoso et al., 2022). KKNI is a guide for new job seekers and old workers in an effort to improve their standard of living or career in their respective workplaces. In addition, KKNI can comprehensively and fairly accommodate the needs of all parties related to employment and gain the trust of the wider community (“Reducing Red Tape Essential for Economic Growth,” 2012).

A deep understanding of the competencies required by building construction engineering professionals is crucial to ensuring the success of high-rise building projects, both in terms of structural safety, construction quality, efficiency, and compliance with applicable regulations and standards (Rezqiana et al., 2023.). With a solid grasp of these competencies, construction companies and professionals in this field can develop appropriate competency development strategies to enhance the quality, safety, and sustainability of high-rise building construction projects. To achieve these competencies, especially professional competencies, Building Engineering Education graduates must be provided with knowledge relevant to the times, community development, and employment needs. Especially with the development of the curriculum become KKNI oriented curriculum, it clearly demands a dominant change in both the structure and content of the courses in each study program (Wirda & Rahmad, 2019). The challenge for vocational education is updating the curriculum content to reflect technological developments and industrial changes (Diwanggoro & Soenarto, 2020; Setiyawami et al., 2019; Sudira, 2019; Sulistianingrum et al., 2023; Suyanto & Sofyan, 2017), so it is important to integrate competencies according to job positions into the curriculum. The solution to synchronizing the curriculum and industrial competencies is to restructure existing courses so that teaching is more efficient and there is more collaboration between industry and academics in the field of education (Khurniawan, 2019; Langie & Craps, 2020; Ramadhan et al., 2013; Utami et al., 2022; Wijayanti & Jaedun, 2019).

The purpose of this study is to map the qualifications of technicians/analysts based on the Construction Sector Competency Standards (SKKNI). In addition, an analysis is carried out regarding the suitability (relevance) of competency units to course achievements to see what competencies still need to be accommodated by the existing curriculum. KKNI requires universities to produce graduates with main competencies, supporting and additional competencies, and qualifications that are acceptable and relevant to the work skills accepted in the job market (Pratidina Tenda et al., 2024). KKNI is a solution to many problems in the education and training system (Allais, 2011; Stanway, 2023; Yuwono, 2019). It aligns with the Directorate of Instructor and Training Personnel Development, Ministry of Manpower and Transmigration, to develop the Indonesian National Qualifications Framework, abbreviated as KKNI. Furthermore, this becomes a reference in curriculum development (Solikhah, 2015).

This study is expected to be a consideration in recommendations to strengthen the existing curriculum so that students who graduate from Building Engineering Education are expected to have competencies according to industry needs. In addition, it can also be an initial basis for revitalizing the curriculum for courses that have yet to be accommodated in Building Engineering Education. Thus, identification and mapping of the skills needed and analysis of the suitability of the curriculum to industry needs are important steps in ensuring that Building Engineering Education graduates are ready to compete in the labor market. This study not only aims to strengthen the existing curriculum but also to provide recommendations for accommodating skills that still need to be accommodated so that Building Engineering Education graduates can meet the needs of the ever-growing construction industry.

Research Methodology

This research is a descriptive quantitative research with a document analysis method and continued with Focus Group Discussion (FGD) with Building Engineering Education lecturers. The data used in this study are Semester Learning Design (RPS) of the Building Engineering Education Study Program, State University of Jakarta and the type of SKKNI competency in the field of construction, sub-classification of Building and Construction Management. The types of competencies in SKKNI levels 4, 5, and 6 in the field of construction are analyzed for their suitability with the learning outcomes in each course. The results of the analysis are in the form of a percentage score of the suitability of the job position with the course with the level of relevance: Very Irrelevant, Irrelevant, Quite Relevant, Relevant, and Very Relevant. This research was conducted in two stages: the first stage of data collection and the second stage of data processing and analysis. Then, after the quantitative data is collected and analyzed, FGD is conducted to further explore the findings, provide additional perspectives, and confirm recommended courses to meet the requirements of the SKKNI.

Research Results and Discussion

Mapping of Job Levels

Based on the findings in the SKKNI document that focuses on civil classification with building subclassification and the implementation management classification, it is seen that work qualification levels (KKNI) 4, 5, and 6 have a clear structure in determining competency units, competency elements, and performance criteria. This analysis shows how the competency details filtered according to the SKKNI provide a comprehensive picture of industry needs and workforce readiness.

Table 1. Job Position Level, KKNI, and SKKNI Building Classification Number

NO	CODE	Job Position	KKNI Level	No. SKKNI
1	GD01	Field Manager for Building Work Implementation	6	SKKNI 108-2015
2	GD02	Head of Building Environmental Management	6	SKKNI 046-2015
3	GD03	Junior Building Work Field Executor	4	SKKNI 193-2021
4	GD04	Intermediate Building Work Field Executor	5	SKKNI 193-2021
5	GD05	Building Structure Work Supervisor	4	SKKNI 340-2013
6	GD06	Intermediate Building Structure Work Supervisor	5	SKKNI 340-2013
7	GD07	Senior Building Structure Work Supervisor	6	SKKNI 340-2013
8	GD08	Middle Building Maintenance Executor	5	SKKK 37-2022
9	GD09	Building Draftsman	4	SKKNI 033-2021

NO	CODE	Job Position	KKNI Level	No. SKKNI
10	GD10	RISHA Building Structure Planner	6	SKKNI 221-2018

In the data analysis conducted in 2024, it was found that in the civil subclassification with building classification, there were a total of 71 job levels listed in the Indonesian National Work Competency Standards (SKKNI). Of the 71 job levels, 14 job levels were categorized for technicians or analysts who were at work qualification levels (KKNI): 4, 5, and 6. However, of the 14 levels, only 10 job levels had detailed SKKNI documents, as shown in Table 1.

Meanwhile, for the Implementation Management classification, there are a total of 39 job levels listed in the SKKNI. Of the 39 job levels, there are 16 job levels categorized for technicians/analysts who are at work qualification levels (KKNI) 4, 5, and 6, according to Table 2, where all of these job levels have SKKNI documents that can be used as references needed by the construction services industry in the world of work.

Table 2. Job Position Level, KKNI, and SKKNI Sub-Classification Number for Construction Management

NO	CODE	Job Position	KKNI Level	No. SKKNI
1	MK01	HSE Personnel	4	SKKNI 038-2019
2	MK02	HSE Supervisor	5	SKKNI 350-2014
3	MK03	Senior HSE Supervisor	6	SKKNI 350-2014
4	MK04	Technical Facilitator in Community-Based Infrastructure Development	5	SKKNI 260-2018
5	MK05	Senior Technical Facilitator in Community-Based Infrastructure Development	6	SKKNI 260-2018
6	MK06	Senior Quality Engineer	5	SKKNI 333-2013
7	MK07	Quality Engineer	6	SKKNI 333-2013
8	MK08	Intermediate Quality Assurance Engineer	5	SKKNI 387-2013
9	MK09	Quality Assurance Engineer	6	SKKNI 387-2013
10	MK10	Junior Estimator	4	SKKK 038-2022
11	MK11	Intermediate Estimator	5	SKKK 038-2022
12	MK12	Senior Estimator	6	SKKK 038-2022
13	MK13	Intermediate Road Cost Estimator	5	SKKNI 385-2013
14	MK14	Road Cost Estimator	6	SKKNI 385-2013
15	MK15	Intermediate Quantity Surveyor	5	SKKNI 06-2011
16	MK16	Senior Quantity Surveyor	6	SKKNI 06-2011

The data related to the job levels above are in accordance with the expectations of Building Engineering Education graduates, who are expected to be able to work as teachers in the field of Building Engineering expertise, professionals in the field of construction services, and entrepreneurs in the field of building engineering. Graduates who work as teachers can take on

roles such as Building Draftsmen, HSE Personnel, HSE Supervisors, and Technical Facilitators, where they can develop and teach technical skills and safety procedures that are important in building engineering education. In addition, graduates who work in the field of construction services can play roles as Building Work Implementation Field Managers, Head of Building Environmental Management, Building Work Field Executors (Junior, Intermediate, and Senior Expert), and various positions in supervision and implementation of building structures. These positions require skills in quality control, management of the use of materials and tools, and the implementation of Health, Safety, and Environment (HSE) procedures, which are important competencies to ensure construction projects run efficiently and safely. For graduates who are entrepreneurs, roles such as RISHA Building Structure Planner, Road Cost Estimator, Quantity Estimator, and Quality Assurance Engineer are very relevant, as they require the ability to plan and control construction projects, manage work teams, and ensure the quality of construction work. These competencies are essential to support the success of their business in the construction sector and ensure that the projects they work on meet industry standards.

Competency Units and Subject Relevance

In the previous data, it was shown that there were ten job levels from the Building subclassification and 16 job levels from the Implementation Management subclassification. The data was then analyzed against the competency units that were checked for relevance to all courses in the Building Engineering Education study program with the results below:

Table 3. Relevance of Competency Units and Courses

No	Position Level (Code)	KKNI Levell	Number of Unit	Present in Course	Not Present in Course	Skor (%)	Ket
1	GD01	6	6	4	2	67%	R
2	GD02	6	10	8	2	80%	R
3	GD03	4	7	6	1	86%	VR
4	GD04	5	7	6	1	86%	VR
5	GD05	4	9	7	2	78%	R
6	GD06	5	9	7	2	78%	R
7	GD07	6	9	7	2	78%	R
8	GD08	5	7	7	0	100%	VR
9	GD09	4	7	7	0	100%	VR
10	GD10	6	21	14	7	67%	R
11	MK01	4	13	8	5	62%	R
12	MK02	5	8	3	5	38%	I
13	MK03	6	8	3	5	38%	I
14	MK04	5	14	11	3	79%	R

No	Position Level (Code)	KKNI Levell	Number of Unit	Present in Course	Not Present in Course	Skor (%)	Ket
15	MK05	6	14	11	3	79%	R
16	MK06	5	7	4	3	57%	QR
17	MK07	6	7	4	3	57%	QR
18	MK08	5	7	4	3	57%	QR
19	MK09	6	7	4	3	57%	QR
20	MK10	4	5	5	0	100%	VR
21	MK11	5	5	5	0	100%	VR
22	MK12	6	5	5	0	100%	VR
23	MK13	5	7	7	0	100%	VR
24	MK14	6	7	7	0	100%	VR
25	MK15	5	11	10	1	91%	VR
26	MK16	6	12	11	1	92%	VR

Keterangan:

- 0-20% : Totally Irrelevant (TI)
- 21-40% : Irrelevant (I)
- 41-60% : Quite Relevant (QR)
- 61-80% : Relevant (R)
- 81-100% : Very Relevant (VR)

The table above describes that each job level has several competency units that graduates must master. These competency units are then identified and analyzed for their relevance to the learning outcomes of the courses in Building Engineering Education. Competency units that are not yet included in the learning outcomes of the courses are compared with competency units that are relevant to the learning outcomes of the courses, and the score results are obtained in the form of a percentage based on the relevance scale.

Job levels that get a score of 0-20% can be interpreted as Totally Irrelevant (TI) courses with competency units, a score of 21-40% courses Irrelevant (I) with competency units, a score of 41-60% courses (QR) Quite Relevant with competency units, a score of 61-80% courses Relevant (R) with competency units, a score of 81-100% courses Very Relevant (VR) with competency units. In the Building subclassification, there are six job levels that are Relevant to Building Engineering Education courses, namely GD01(Field Manager for Building Work Implementation), GD02 (Head of Building Environmental Management), GD05 (Building Structure Work Supervisor), GD06 (Intermediate Building Structure Work Supervisor), GD07 (Senior Building Structure Work Supervisor), and GD10 (RISHA Building Structure Planner); and four job levels that are Very Relevant to Building Engineering Education courses, namely GD03 (Junior Building Work Field Executor), GD04 (Intermediate Building Work Field Executor), GD08 (Middle Building Maintenance Executor), GD09 (Building Draftsman).

In the Implementation Management subclassification, two job levels are Irrelevant (I) to Building Engineering Education courses, namely MK02 (HSE Supervisor) and MK03 (Senior HSE Supervisor); 4 job levels that are Quite Relevant to Building Engineering Education courses, namely MK06 (Senior Quality Engineer), MK07 (Quality Engineer), MK08 (Intermediate Quality Assurance Engineer), and MK09 (Quality Assurance Engineer); 3 job levels that are Relevant to Building Engineering Education courses, namely MK01 (HSE Personnel), MK04 (Technical Facilitator in Community-Based Infrastructure Development), MK05 (Senior Technical Facilitator in Community-Based Infrastructure Development); 7 job levels that are Very Relevant to Building Engineering Education courses, namely MK10 (Junior Estimator), MK11 (Intermediate Estimator), MK12 (Senior Estimator), MK13 (Intermediate Road Cost Estimator), MK14 (Road Cost Estimator), MK15 (Intermediate Quantity Surveyor), MK16 (Senior Quantity Surveyor).

The results of the analysis of 26 sub-classification work levels of Building and Implementation Management show that 11 job positions are relevant to the achievement of the courses in Building Engineering Education, and two job levels are not relevant to the achievement of the courses in Building Engineering Education. In fulfilling the relevance of the engineering education curriculum, it must be reoriented to address global challenges and use an approach to integrate strategic sustainability competencies into the curriculum (Leifler & Dahlin, 2020), such as integrating the curriculum with the competencies needed by industry.

Percentage of Curriculum Fulfillment of Expected Competencies

Each of the competency units in the SKKNI is a major achievement in demonstrating the ability of workers in the construction industry. The competency units are checked for their suitability to the fulfilment of the knowledge aspects described in the curriculum of each existing course. There is a threshold used in the reference to indicate whether construction service workers can be classified as competent or not yet competent, namely with a minimum value of 70% for the knowledge aspect.

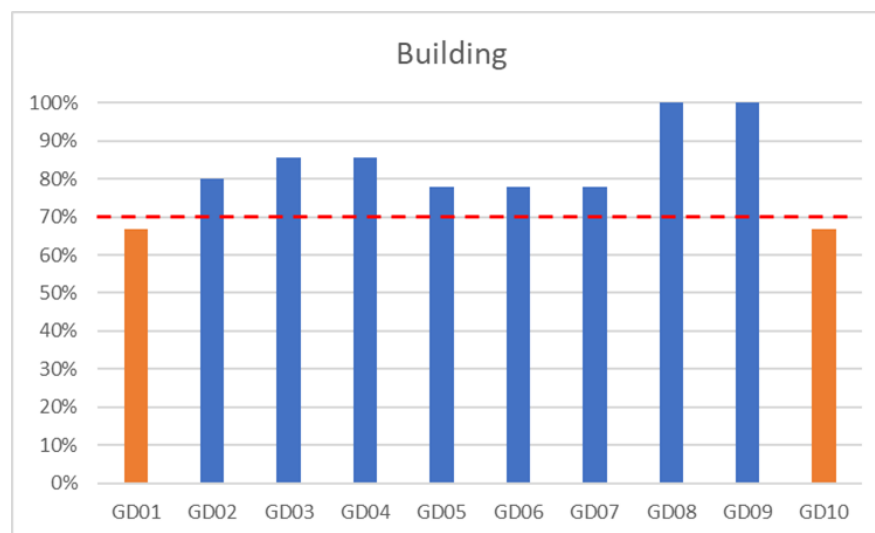


Figure 1. Percentage of Compliance with Building Subclassification Competencies

From the data above, it can be seen that in addition to several competency fulfillments that have not been presented in the existing curriculum, Building Engineering Education graduates will also have difficulty being categorized as workers with competent status if there are competencies that have not reached the 70% threshold. From the data shown for the building subclassification, the GD01 (Field Manager for Building Work Implementation) and GD10 (RISHA Building Structure Planner) job levels have values below the threshold. This result is because Building Engineering Education students are still not taught enough about how to do work according to the correct construction method, especially in carrying out preparatory work and final work, both

technically and commercially, to fulfil the GD01 position. In addition, there is also a gap at the GD10 job level where special courses for precast concrete material that functions to withstand earthquakes with the RISHA system have not become a mandatory curriculum at Building Engineering Education.

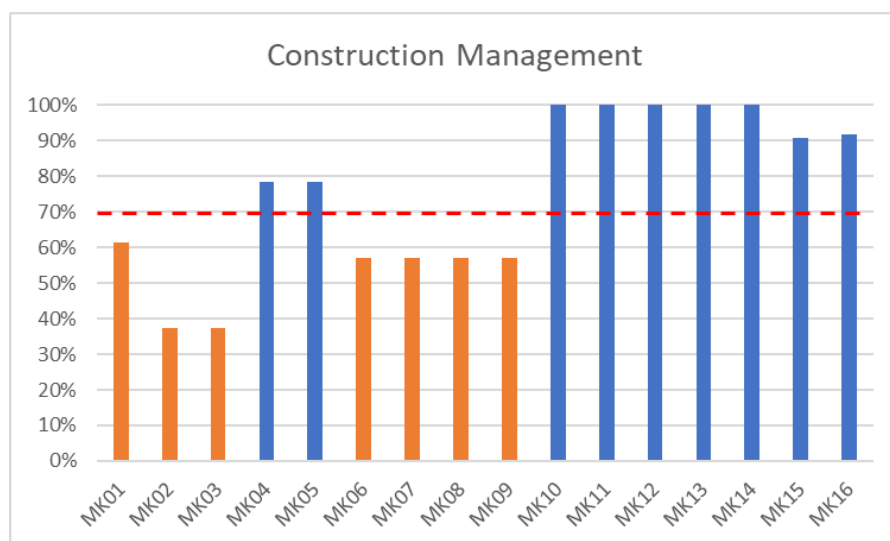


Figure 2. Percentage of Competency Fulfillment of Sub-Classification of Implementation Management

From the data shown for the subclassification of implementation management, the job levels MK01 (HSE Personnel), MK02 (HSE Supervisor), MK03 (Senior HSE Supervisor, MK06 (Senior Quality Engineer), MK07 (Quality Engineer), MK08 (Intermediate Quality Assurance Engineer), and MK09 (Quality Assurance Engineer) have values below the threshold. This result is because Building Engineering Education students are still not taught enough about HSE and Quality (QHSE). Research (Herlambang et al., 2018) also shows that the suitability of the HSE Course Syllabus to the SKKNI is only 28.57%. The courses that are currently specifically related to HSE are only related to HSE, and even then, they still do not meet the minimum competency standards because there are gaps, especially in the areas of HSE planning, emergency response, and HSE supervision programs. In addition, for courses related to quality itself, there are no special courses, so many competency fulfillments from the Quality job level are not met.

Curriculum Improvement for Uncovered Competencies from SKKNI

From several GAPs, an analysis is then carried out regarding improvements that can be made to existing courses to meet the competencies in the curriculum. In addition, an analysis is also carried out if there is a potential course that needs to be added to the existing curriculum conditions.

Table 4. Building Subclassification Uncovered Competency Units in the Course

No	Uncovered Competencies in Building Engineering Education Courses	Potential Courses
1	Conducting Preparatory Work	Construction Methods
2	Conducting Final Work	Construction Methods
3	Implementing Energy Saving Program	Sustainable Construction, AMDAL

4	Conducting Emergency Handling	HSE
5	Conducting Preparatory Work	Construction Methods
6	Conducting Field Supervision Preparatory Work	Construction Methods
7	Conducting Final Supervision Preparatory Work	Construction Methods
8	Conducting Final Supervision Preparatory Work	Construction Methods
9	Conducting Final Supervision Preparatory Work	Construction Methods
10	Calculating RISHA Panel Requirements	Sustainable Construction
11	Creating RISHA Building Assembly Planning Concepts	Sustainable Construction
12	Printing RISHA Panels	Sustainable Construction
13	Conducting Curing Process	Material Testing Practices
14	Conducting RISHA Structural Work	Sustainable Construction
15	Evaluating RISHA Panel Products	Sustainable Construction
16	Conducting RISHA Building Maintenance	Sustainable Construction

Table 5. Construction Management Subclassification Uncovered Competency Units in the Course

No	Uncovered Competencies in Building Engineering Education Courses	Potential Courses
1	Designing Emergency Response System	HSE
2	Conducting OHS Communication	HSE
3	Supervising Work Permit Implementation	Construction Methods
4	Managing Emergency Response Actions	HSE
5	Evaluating Compliance with OHS Requirements and Procedures	HSE
6	Planning Supervision Program	HSE
7	Conducting Preparation for Supervision Implementation	HSE
8	Conducting Supervision Activities	HSE
9	Conducting Supervision Program Evaluation	HSE
10	Supervising Corrective Actions	HSE
11	Assessing Community-Based Infrastructure Construction	HSE

No	Oncovered Competencies in Building Engineering Education Courses	Potential Courses
12	Preparing Operational Management and Maintenance of Community-Based Infrastructure	Sustainable Construction
13	Preparing Report on Implementation of Community-Based Infrastructure Development Activities	Sustainable Construction
14	Controlling Quality of Equipment Capacity	Sustainable Construction
15	Controlling Quality in the Construction Implementation Process	Mechanical Earthmoving
16	Creating Quality Control Results Report	Sustainable Construction / Construction Methods
17	Preparing Quality Plan for Activities According to Contract (Quality Plan)	Sustainable Construction / Construction Methods
18	Socializing Quality Manual, Procedures and Work Instructions	Sustainable Construction / Construction Methods
19	Conducting Review of Quality Assurance Implementation	Sustainable Construction / Construction Methods
20	Providing Assistance to Loss Adjusters in Assessing Losses	Sustainable Construction / Construction Methods
21	Carrying Out Duties and Functions as Expert Witnesses	Sustainable Construction / Construction Methods

In accordance with the previous explanation, which shows that there is a GAP in competencies related to preparatory work or final work, emergency response and HSE supervision, as well as competencies for quality engineers that have not been met, then strengthening aspects of learning outcomes in the existing curriculum will be carried out for HSE courses, Material Testing Practices, AMDAL, and Mechanical Earthmoving to address these gaps. In addition, new courses are needed that are able to accommodate the stages of construction so that students get an overview of the implementation methods in construction projects with the Construction Methods course. Another important course is related to the latest developments in the construction industry that lead to community-based sustainable development, which can be outlined in the Sustainable Construction course. This course will discuss the latest developments in construction science that support sustainability aspects such as BIM, Value Engineering, Lean Construction, and other Construction Sustainability courses.

Conclusion

Based on data analysis conducted in 2024 on civil subclassification with building classification and implementation management, it was found that work qualification levels (KKNI) 4, 5, and 6 have a clear structure in determining competency units, competency elements, and performance criteria. Of the 71 job levels listed in the SKKNI, 14 of them are categorized for technicians or analysts at work qualification levels (KKNI): 4, 5, and 6. However, only ten job levels have detailed SKKNI documents. Meanwhile, in the implementation management

classification, of the total 39 job levels, there are 16 job levels for technicians/analysts at work qualification levels (KKNI) 4, 5, and 6, all of which have detailed SKKNI documents.

This finding shows that the available job levels are in accordance with the expectations of Building Engineering Education graduates, who are expected to be able to work as teachers in the field of Building Engineering expertise, professionals in the construction services sector, and entrepreneurs in the building engineering sector. However, some gaps in the curriculum need to be addressed to ensure that graduates have competencies that are in line with industry standards. The analysis shows that in the building sub-classification, several job levels, such as Building Work Implementation Field Manager and RISHA Building Structure Planner, have scores below the 70% threshold, indicating that there is a need for improvement in teaching construction methods and precast concrete technology. In the implementation management classification, job levels related to HSE and Quality Engineer also show deficiencies in fulfilling competencies, indicating the need to add new courses and strengthen the existing curriculum. Courses such as HSE, Material Testing Practices, AMDAL, and Mechanical Earthmoving need to be strengthened. In contrast, new courses such as Construction Methods and Sustainable Construction need to be introduced to address existing competency gaps.

Overall, the adjustment of the Building Engineering Education State University of Jakarta curriculum with SKKNI is needed to ensure that graduates are ready to meet industry needs and can work competently in various available job levels. If the curriculum is not adapted to the SKKNI, it will indicate a lack of competence of Building Engineering Education graduates in a work position in the construction sector. This adjustment will help improve the quality and competitiveness of graduates in the job market and support the development of the construction industry.

References

- Akyazi, T., Alvarez, I., Alberdi, E., Oyarbide-Zubillaga, A., Goti, A., & Bayon, F. (2020). Skills needs of the civil engineering sector in the european union countries: Current situation and future trends. *Applied Sciences (Switzerland)*, *10*(20), 1–24. <https://doi.org/10.3390/app10207226>
- Allais, S. (2011). What is a National Qualifications Framework? Considerations from a Study of National. *Journal of Contemporary Educational Studies*, *5*, 106–124.
- Asfiyanur, E. P., Sumardi, K., Hamdani, A., & Abdullah, A. G. (2018). Requirement analysis of work competence of vocational graduates in heavy equipment industry. *IOP Conference Series: Materials Science and Engineering*, *434*(1). <https://doi.org/10.1088/1757-899X/434/1/012302>
- Béduwé, C., & Giret, J. F. (2011). Mismatch of vocational graduates: What penalty on French labour market? *Journal of Vocational Behavior*, *78*(1), 68–79. <https://doi.org/10.1016/j.jvb.2010.09.003>
- Building Engineering Education Study Program. (2024). <https://ft.unj.ac.id/program-studi-pendidikan-teknik-bangunan/>
- Choirunnisa, Ifa; Muladi, Muladi; Devi, M. (2018). Analisis Pengembangan Laboratorium Teknik Instalasi Fiber Optik pada Sekolah Menengah Kejuruan untuk Mencapai Standar Kompetensi sesuai dengan SKKNI dan Kebutuhan DU/DI. *Jurnal Pendidikan: Teori, Penelitian, & Pengembangan*, *3*(1), 62–74. <http://dx.doi.org/10.17977/jptpp.v3i1.10374>
- Disas, E. P. (2018). Link and Match sebagai Kebijakan Pendidikan Kejuruan Link and Match as a Vocational Education Policy. *Jurnal Penelitian Pendidikan*.
- Diwanggoro, E., & Soenarto, S. (2020). Development of teaching factory learning models in vocational schools. *Journal of Physics: Conference Series*, *1456*(1). <https://doi.org/10.1088/1742-6596/1456/1/012046>

- Falakh, F. (2022). Identifikasi Standar Kompetensi Kerja Nasional Indonesia (SKKNI) pada Pengembangan Kurikulum Program Studi Teknik Lingkungan. *Journal on Education*, 04(04), 1796–1802. <http://jonedu.org/index.php/joe>
- Kementerian PUPR. (2022, January 19). 2023, *Sektor Konstruksi Serap 8.769.798 Tenaga Kerja*. <https://Bpiw.Pu.Go.Id/>.
- Khurniawan, A. W. (2019). *Turbulensi Dalam Revitalisasi SMK (Pertama)*. UNY Press.
- Langie, G., & Craps, S. (2020). Professional competencies in engineering education: The PREFERed-way. *Informacios Tarsadalom*, 20(2), 142–153. <https://doi.org/10.22503/INFARS.XX.2020.2.10>
- Leifler, O., & Dahlin, J. E. (2020). Curriculum integration of sustainability in engineering education – a national study of programme director perspectives. *International Journal of Sustainability in Higher Education*, 21(5), 877–894. <https://doi.org/10.1108/IJSHE-09-2019-0286>
- Mancotywa, Y. L. (2023). *Repurposing Rural Technical Vocational Education and Training in South Africa*.
- Menteri Ketenagakerjaan Republik Indonesia. (2020). *Keputusan Menteri Ketenagakerjaan Republik indonesia No. 333 Tahun 2020*.
- Muhammad, I., & Ariani, S. (2020a). The Development of KKNI-Based Curriculum at the Arabic Language Education Programs in Indonesian Higher Education. *Jurnal Ilmiah Peuradeun*, 8(3), 451–474. <https://doi.org/10.26811/peuradeun.v8i3.543>
- Muhammad, I., & Ariani, S. (2020b). The Development of KKNI-Based Curriculum at the Arabic Language Education Programs in Indonesian Higher Education. *Jurnal Ilmiah Peuradeun*, 8(3), 451–474. <https://doi.org/10.26811/peuradeun.v8i3.543>
- Muja, A., Blommaert, L., Gesthuizen, M., & Wolbers, M. H. J. (2019). The vocational impact of educational programs on youth labor market integration. *Research in Social Stratification and Mobility*, 64. <https://doi.org/10.1016/j.rssm.2019.100437>
- Nkwanyane, T. P. (2023). Understanding the Demand for Industrial skills through the National Certificate (Vocational) Building and Civil Engineering Programme. *International Journal of Learning, Teaching and Educational Research*, 22(5), 674–687. <https://doi.org/10.26803/ijlter.22.5.35>
- Oroh, R. R. (2023). Analysis of the Need for Construction Services towards the Minimum Competency Standards for Vocational Student Work Attitudes. In *IJEVSS* (Vol. 02).
- Pratidina Tenda, M., Syamsul Bahri, E., & Lumataw, J. A. (2024). Indonesian National Job Qualifications: Literature Review. *JOURNAL OF PSYCHOLOGY AND SUSTAINABLE EDUCATION (JPSE)*, 1(2). <https://journal.p2ti.com/index.php/jpse/index>
- Program Studi S1 Pendidikan Teknik Bangunan*. (2024). <https://ft.unj.ac.id/program-studi-pendidikan-teknik-bangunan/>
- Ramadhan, M. A., Iriani, T., & Handoyo, S. S. (2013). Relevansi Kompetensi Lulusan SMK Khususnya Kompetensi Keahlian Teknik Gambar Bangunan dengan Kompetensi yang Dibutuhkan di Dunia Kerja. *Jurnal Pensil*, 2(1), 1–10. <https://doi.org/10.21009/jpensil.v2i1.7282>
- Reducing red tape essential for economic growth. (2012, April 30). <https://www.ceda.com.au/newsandresources/news/government-regulation/reducing-red-tape-essential-for-economic-growth>

- Rezqiana, A., Eka Murtinugraha, R., & Widiasanti, I. (2023). *Identifikasi Kompetensi yang dibutuhkan Tenaga Ahli Teknik Bangunan Gedung pada Industri Konstruksi*. <https://doi.org/10.36312/jcm.v3i1.1916>
- Samsul, E., Muchtar, H., & Mahbulbul, W. (2023). Pelatihan Unit Kompetensi Mengoperasikan PLC SKKNI 631 Tahun 2016 untuk Guru Mekatronika SMK Negeri 10 Bekasi. *BERNAS: Jurnal Pengabdian Kepada Masyarakat*, 4(1), 219–228. <https://doi.org/https://doi.org/10.31949/jb.v4i1.3997>
- Santoso, M., Firdaus, A. R., Djajanto, L., & Prayogo, R. D. R. B. P. (2022). *Panduan Penyusunan Kurikulum Pendidikan Tinggi Vokasi*.
- Setiyawami, Sugiyo, Sugiyono, & Rahardjo, T. J. (2019). The Industrial Revolution 4.0 Impact on Vocational Education in Indonesia. *ICONECT*, 3–7. <https://doi.org/10.4108/eai.20-8-2019.2288089>
- Solikhah, I. (2015). KKNi dalam Kurikulum Berbasis Learning Outcomes. *LINGUA: Journal of Language, Literature and Teaching*, 12(1), 1–22.
- Stanway, J. , B. A. , R. M. , S. T. , B. A. , C. D. , H. S. , P. G. , E. S. , E. D. , & C. S. (2023). National Seismic Qualification Framework for Non-Structural Elements. *CONFER.NZ/SESOC2023*.
- Sudira, P. (2019). The Role of Vocational Education in the Era of Industrial Automation. *Journal of Physics: Conference Series*, 1273(1). <https://doi.org/10.1088/1742-6596/1273/1/012058>
- Sulistianingrum, M., Murtinugraha, E., & Daryati. (2023). 35970-Article Text-106668-1-10-20230904. *Prosiding Seminar Pendidikan Kejuruan Dan Teknik Sipil*, 1, 56–63.
- Suyanto, W., & Sofyan, H. (2017). Vocational Education Development Framework in 21 st Century. *Advances in Social Science, Education and Humanities Research*, 102, 395–398.
- Suyono, Basori, I., Syamsuir, & Syaefudin, E. A. (2023). Pedoman Akademik 2023/2024 FT Fakultas Teknik Universitas Negeri Jakarta. In *PEDOMAN AKADEMIK 2023/2024 FT Fakultas Teknik Universitas Negeri Jakarta*.
- Utami, S., Widarto, W., & Arifah, S. (2022). Relevance Employability Skills of Vocational High School Students' Department of Sanitation Building Construction and Maintenance in Diy To the Construction Service Industry. *Jurnal PenSil*, 11(3), 186–196. <https://doi.org/10.21009/jpensil.v11i3.27157>
- Utomo, W. (2021). Paradigma Pendidikan Vokasi: Tantangan, Harapan Dan Kenyataan. *Assessment, and Evaluation Education*, 1(2), 65–72. <http://almufi.com/index.php/AJMAEEhttp://almufi.com/index.php/AJMAEE>
- van der Molen, H. F., Basnet, P., Hoonakker, P. L. T., Lehtola, M. M., Lappalainen, J., Frings-Dresen, M. H. W., Haslam, R., & Verbeek, J. H. (2018). Interventions to prevent injuries in construction workers. *Cochrane Database of Systematic Reviews*, 2018(2). <https://doi.org/10.1002/14651858.CD006251.pub4>
- Wibowo, S., Darnita, Y. D. Y., & Muntahanah, M. (2022). Workshop Network Administrator Muda Dalam Kompetensi Kerja di Era Industri 4. 0. *Abdi Reksa*, 3(1), 16–22. <https://ejournal.unib.ac.id/index.php/abdireksa/article/view/17860>
- Wijayanti, M., & Jaedun, A. (2019). Relevansi Kompetensi Lulusan Kejuruan Teknik Bangunan untuk Bekerja Di Industri Konstruksi. *Jurnal Kependidikan*, 3(1), 81–94.
- Wirada, M. A., & Rahmad, R. (2019). *Developing of The Demography Teaching Book Based on KKNi-Curriculum and High Order Thinking Skills*.

Yuwono, U. (2019). Ideologies underpinning the Indonesian National Qualification Framework (IQF) for higher education website text. *Indonesian Journal of Applied Linguistics*, 8(3), 668–677.