



Literature Review: Study of the Relevance of the Mining Vocational Education Curriculum in the Preparation of the MBKM

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Abstract. This research is a literature study that examines the relevance of the mining vocational education curriculum in the preparation of MBKM. The problem that occurs today is that the curriculum is not relevant and not in accordance with the needs of industry and the field of work, and for that need to do curriculum relevance, and preparation in facing MKBM. This research method uses a literature review study. The findings prove that it is necessary to carry out the relevance of the mining vocational education curriculum starting from the MBKM policy design, MBKM preparation, and MBKM implementation, besides that it also needs to be relevant to the curriculum for analyze the competence of the mining job field required by the company and disclose a map of mining job positions relevant to preparation for the MBKM curriculum.

Keywords: Relevance Curriculum · MBKM Preparation · Vocational Education · Mining Engineering

1 Introduction

Vocational education aims to prepare students to have certain applied skills after completing their education and important experience in the mining field (Sutarna et al. 2020); (Ozcan zyurt, et, al, 2021). Developing issues related to the irrelevance of the curriculum in vocational education with the world of business and industry are in the spotlight for curriculum reconstruction. The essence of the curriculum is the main component of education and as a learning guide. Curriculum as stipulated in the regulation of the minister of research, technology and higher education No.44 of 2015: SN-DIKTI is a set of plans and arrangements regarding graduate learning outcomes, study materials, processes, and assessments that are used as guidelines for the implementation of study programs. In the National Higher Education Standards (SN-Dikti), learning outcomes consist of elements of attitudes, general skills, special skills, and knowledge (Arifin, 2020); (Martini, et al. xxxx). The curriculum is a very important part of creating a contextually relevant and responsive learning and teaching environment for lecturers and students (Druzhinina, et al. 2018).

*MBKM: “Merdeka Belajar Kampus Merdeka”.

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The curriculum contains beliefs, values, attitudes, skills, knowledge and all about education (Maryanti, et al., 2021). The curriculum must of course be designed to ensure the quality of specialist training in the professional education system (Druzhinina, et al., 2018). Curriculum can be designed up to date, relevant, interesting and stimulating for students (Druzhinina, et al. 2018). If the curriculum is designed and structured well, learning objectives can be achieved more effectively. Reconstruction and curriculum change have the essence that a future-oriented and relevant curriculum is able to make learning better and produce quality graduates (Suryaman, 2020).

The basis for curriculum changes in a study program is based on Presidential Regulation Number 8 of 2012 concerning the Indonesian National Qualifications Framework (KKNI) and Minister of Education and Culture Number 3 of 2020 concerning Higher Education Standards. The concept of education management at a good university must be output-based or known as Outcome-Based Education (OBE) which relies on educational outcomes, such as the number of graduates, GPA, and the success rate of graduates (Suryaman, 2020). The curriculum must be able to be adjusted in the implementation of education program policies, one of which is the Merdeka Belajar Kampus Merdeka (MBKM) program.

The MBKM program is an opportunity to collaborate between educational institutions and the Business and Industry World as needed, meeting demands (Andari et al. 2021); (Chrisyarani, et al., 2022). Learning in the Kampus Merdeka is one of the manifestations of student-centered learning (Chrisyarani, et al., 2022). The MBKM program is implemented in eight forms of learning activities to achieve the KPI (Key Performance Indicators) achievement target (Maryanti et al. 2021); (Chrisyarani, et al., 2022). To produce a vocational education curriculum that is in line with KKNI, SN-DIKTI and responds to the challenges of the times, it can be done by integrating the MBKM program. The curriculum developed is also in line with the MBKM program which includes 8 forms of learning activities. To support the relevance of the curriculum that supports the MBKM program, there are 8 forms of programs, namely: student exchanges, internships/work practices, teaching assistance, research, independent projects, entrepreneurship, village building and humanitarian projects (Rofii, & Siswanto, 2021).

MBKM has a goal to provide an autonomous and flexible learning process in higher education, the target of which is to be able to provide quality graduates in accordance with the needs of the 21st century and the industrial era 4.0 (Vhalery et al. 2022). With the MBKM program, students are expected to be able to develop soft skills and hard skills and be ready to face the challenges of the times (Suhartoyo et al. 2020); (Chrisyarani, et al., 2022). Knowledge through realities and field dynamics such as capability requirements, real problems, social interaction, collaboration, self-management, performance demands, targets and achievements (Baharuddin 2021; Tohir 2020), is part of the MBKM program.

The era of the industrial revolution which is growing very rapidly has made vocational education must follow the flow of these developments. In the preparation and improvement of the curriculum in the industrial era 4.0, it is necessary to emphasize collaboration between academics and the industrial world as well as MBKM preparation. This is because the curriculum is the main milestone in conveying knowledge in which there are study materials that are adapted to enrichment and development. One that needs

to be relevant is the curriculum in the mining sector. In PP 41 of 2015, it is explained that the development and preparation of industrial workers, including in this case of course the industry and business fields engaged in mining, must prepare their workforce through industrial vocational education schemes, while still emphasizing and increasing competence, industrial internships, as well as providing evidence of recognition in the form of competency certificates.

To ensure that mining activities can continue to run smoothly and sustainably and can contribute to state revenue, it is necessary to prepare a skilled and capable workforce in accordance with the needs of each stage of the mining business carried out. The preparation of competent workforce is carried out through training and education programs. Therefore, the vocational education curriculum must be relevant to the competence in the mining sector.

The problems that occur are the irrelevance of the curriculum, such as the absorption of graduates in the world of work and industry, formulating graduate profiles, learning achievements that have not been fulfilled, curriculum readiness with the MBKM program, learning activities that still have weaknesses with the implementation of methods, models and learning media, appropriate. With a graduate profile, learning outcomes that are not yet aligned, resulting in implementation will also not be aligned (Suryaman, 2020).

Based on the reality that happened in the Diploma III (D3) mining engineering study program, FT UNP; graduates have not been absorbed as a whole, the differences in the job placements of mining vocational graduates are not clear, the fields of work that are not relevant to the field studied (Paul Othusitse Dipitso, 2020). Besides that, there is still no curriculum preparation to support the implementation of the MBKM program in mining vocational education.

Based on the explanation of the problems above, the researchers conducted a literature study to offer solutions by clarifying the relevance of the mining vocational education curriculum in the preparation of MBKM. To examine what things need to be prepared, provide information, provide recommendations for curriculum improvements in preparation for the implementation of MBKM.

2 Methods

This study uses a literature review study method. Using library materials in the form of journal articles, books, magazines, and newspapers. Data collection was taken based on search results from keywords (curriculum, curriculum and relevance, vocational education, mining, MBKM, independent learning, independent campus) conducted in various online reference sources. Researchers reviewed and relevant articles according to the topics raised, and the content of the relevance of the mining vocational education curriculum in the preparation of MBKM. After the selection process is carried out, the selected articles are reviewed for literature review. The results of the study are used as the basis for compiling the suitability and relevance of the mining vocational education curriculum in the preparation of MBKM, and this will be in line with the relevance between the CPL of the study program and the needs of DUDI.

Table 1. Review of Past Research

| Topics | Researcher (Year) |
|--|---|
| Curriculum, relevance and vocational education | Anggry et al. (2021), Maryanti et al. (2021), Kim and Jung (2019), Druzhinina et al. (2018), Finch and Crunkilton, (1999) |
| MBKM Curriculum Concept and Implementation | Sopiansyah et al. (2022), Purwanti, E (2021). Anjelina, Silvia, & Gitituati. (2021). Alatas and Si23, (2021). |
| Campus policy of independent learning and 6C | Rohiyatussakinah, I. (2021). |
| MBKM curriculum | Suwandi (2020), Baharuddin, (2021). Vhalery et al. (2022), Suryaman, (2020). |
| MBKM | Muhsin, H. (2021), Martini et al. (2021), Rofii, & Siswanto (2021), Andari, et al. (2021), Chrisyarani et al. (2022), Puspitasari and Nugroho (2021), Ditjen-Dikti (2020), Kemendikbud (2020) |

3 Results and Discussion

In substance, vocational education must display characteristics that are reflected in aspects that are closely related to curriculum planning, namely the vocational education curriculum has been oriented towards process and results. Finch & Crunkilton (1999:14) suggest that the vocational education curriculum is process-oriented (experiences and activities in the campus environment) and results (the influence of these experiences and activities on students). However, the main success of the vocational education curriculum is not only measured by the educational success of students at school, but also by the results of work performance in the field of work.

In vocational education the role of the curriculum is the spearhead in the implementation of learning. The curriculum in vocational education is inseparable from the development of knowledge about a particular field, but must simultaneously prepare productive students. According to Finch & Crunkilton (1999:15) vocational education curriculum is directly related to helping students to develop a broad level of knowledge, skills, attitudes, and values. Each of these aspects eventually adds up to a number of graduate employability.

For curriculum development in vocational education there needs to be a clear reason or justification. The justification for vocational education is that there is a real need for labor in the business and industrial world, this need is in line with the development of the Industrial Revolution 4.0 which also affects the demand for labor, so that it has an impact on the curriculum, learning tools, equipment, infrastructure development, and learning from related patterns, with a vocation as a ready-to-use graduate printer. Currently, of course, curriculum products must undergo changes in line with the issuance of Presidential Regulation.

Number 8 of 2012 concerning the Indonesian National Qualifications Framework (KKNI) and Minister of Education and Culture Number 3 of 2020 concerning Higher Education Standards. The basis for making curriculum changes refers to the profile of graduates and learning outcomes. The curriculum has several basic elements; objectives, competencies, content, assessment criteria, and learning standards (Ramis, 2020). These elements are contained in the MBKM Curriculum.

Merdeka Belajar Kampus Merdeka (MBKM) is a program that accommodates a university to prepare students to become graduates who are capable in the fields of science and technology, have character and can meet the challenges of the world of work (Puspitasari & Nugroho, 2021); (Oksari, et al., 2022). The MBKM program is the first step to prepare students who can meet the challenges in the world of work. The MBKM program gives freedom and autonomy to educational institutions, free from bureaucratization, lecturers are freed from complicated bureaucracy, and students are given the freedom to choose the fields they are interested in (Suwandi 2020). Students are expected to get to know the world of work or the environment they will live in early after graduating from college. This will have a positive impact because they are used to and are more adaptive in responding to problems that occur in the community and providing solutions according to their scientific capacity (Oksari, et al., 2022).

The MBKM curriculum refers to Law No. 12 of 2012 and the OBE (Outcome based Education) approach to follow the patterns and stages as has been implemented in the curriculum development of study programs. The implementation of policies and the development of the MBKM curriculum accommodates and refers to regulations and social dynamics and advances in science and technology (Vhalery et al. 2022).

The implementation of the MBKM curriculum in accordance with Permendikbud No. 3 of 2020 Article 15 paragraph 1 can be carried out inside the Study Program and outside the Study Program. There are several agreed programs: student exchanges, internships, work practices, teaching assistance in education units, research, research, humanitarian projects, entrepreneurial activities, independent studies/projects, village development/KKN. (Sopiansyah et al. 2022); (Baharuddin, 2021); (Kemendikbud, 2020: Prahani, 2020).

The implementation of the MBKM program is intended for undergraduate and applied undergraduate programs (except in the field of Health). This program is still aimed at fulfilling graduate learning outcomes that have been determined by each study program but with different forms of learning. (Angry et al. 2021). In addition, the MBKM program is also applied to the mining study program.

In the mining sector, there are several competencies that are required, and they have been regulated as contained in the Minister of Energy and Mineral Resources Regulation of 2001 number 006, which relates to technical guidelines for the application of professional competence in the coal and mineral mining sector. In the regulation, eighty units of competence have been listed in detail, which are divided into three major categories; basic competence, technical competence and managerial competence. Therefore, the competencies to be achieved in the mining sector must be relevant to the curriculum in the preparation of MBKM.

Before it is implemented into the MBKM curriculum, it is necessary to make preparations in the formulation of the curriculum to the maximum by involving various partners,

both partners on campus, the business world and other industries. This is very relevant and useful to achieve good learning outcomes in vocational education. Vocational education also involves external parties in formulating the curriculum so that it is relevant to the needs and competencies, so that the results of its graduates can be accepted in the world of work. In addition, other preparations need to be made to adapt the MBKM Curriculum which is the development of the study program curriculum and MBKM activity programs which are followed up through collaboration with partners and implementing activity programs (Baharuddin, 2021). This needs to be re-evaluated continuously regarding the implementation of the MBKM curriculum that has been running. (Oksari, et al., 2022).

Other preparations are to provide study program guidance in vocational education, especially in the relevance of curriculum development, the curriculum development orientation is added to guide the implementation of the MBKM program and the implementation of Outcome Based Education (OBE) which is the standard for assessing the External Quality Assurance System (SPME, National and International Accreditation).

In curriculum development, it is necessary to go through stages that must be passed so that CPL(Graduate Learning Outcomes) has adequate outputs including; 1. The results of the tracer study to find competencies that are in accordance with the developments formulated into the CP (Learning Outcomes). 2. Mapping based on educational needs, national and state life, the world of work, industry, and scientific development. 3. Setting priorities or balances based on needs analysis. 4. Exploration and mapping of appropriate materials. 5. Set a choice between; a. Bringing up new courses, b. Integrate the new competencies formulated into the CP courses that are already available, and/or c. Eliminate some of the existing courses (Mariati, 2021).

Figure 1 below shows the flow of how the study program curriculum in vocational education implements MBKM so that it is relevant. Graduate competency standards, content standards, process standards, and level 6 evaluation standards are regulated in SN-Dikti. Graduate Competency Standards formulated as Graduate Learning Outcomes include General Attitudes and Skills CPL (found in the SN-Dikti Appendix), while Specific Knowledge and Skills CPL is agreed upon by associations/forums managing similar study programs.

The formulation of CPL is also based on the results of the evaluation of the study program curriculum through measuring the achievement of the ongoing curriculum CPL, tracer studies, input from graduate users, alumni, and experts in their fields. Curriculum evaluation also examines the development of science and technology in relevant fields, the needs of the job market, as well as the vision and values developed by each institution.

Based on the results of the curriculum evaluation, a profile of graduates and their descriptions are formulated which are the objectives of the implementation of the mining study program known as the Educational Objective (PEO) Program. The graduate profile that is set becomes the direction in the formulation of learning outcomes, because the attitudes, knowledge, and skills that are formulated build the necessary knowledge and expertise. The curriculum is further developed by identifying and determining study materials and courses that are structured in each semester during the study period. Curriculum development and implementation also refers to SPMI and SPME.

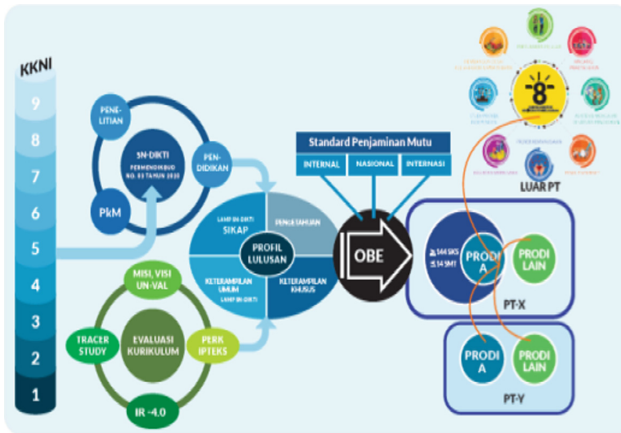


Fig. 1. Curriculum Development Flow to Support MBKM Implementation (Ditjen-Dikti, 2020).

In addition, for preparation in the stage of preparing curriculum documents which are divided into 3 stages,,: (1) Curriculum Design; (2) Learning Design; and (3) Evaluation of Learning Programs. The initial stage starts from a needs analysis to produce a graduate profile, and studies carried out by study programs in accordance with their disciplines. Furthermore, from the two results formulated (CPL), the courses and their credit weights, and the preparation of the course organization in a simple matrix form, the curriculum stages consist of: a. Determination of graduate profiles and formulation of Graduate Learning Outcomes (CPL); b. Determination of study materials and formation of courses; c. Preparation of the matrix of course organization and curriculum maps.

Besides that, efforts are needed to design CPL and courses in mining study programs with partners such as campuses, the business world and industry. Credit recognition for MBKM activities can be carried out in 3 forms, namely structured form, free form and hybrid form. Students in the mining study program can take part in MBKM activities, and of course based on the approval of the supervisor and Head of Study Program. (Directorate General of Higher Education, 2020).

It is necessary to prepare a D3 Mining Engineering curriculum book which contains; vision, mission, study program objectives, graduate profiles and learning outcomes described in the details of the achievement aspects of attitudes, knowledge, general skills and specific skills. The learning process, assessment and curriculum structure that contains details of courses and credits weights, practicum substance and examples in making semester learning plans (RPS) adjust to the MBKM program.

In terms of competence in the field of mining work required by the company as well as existing job maps, based on the data, discussion and analysis in the previous chapter, there are 80 competency units in mining engineering consisting of basic competencies, technical competencies and managerial competencies with 77 types of job maps. Furthermore, related to the job map for Mining Engineering D3 graduates, they can occupy positions as intermediate experts with level 5 at the KKNI, equivalent to technicians, or skilled operators, who bridge between engineers and operators, in some mining companies occupy positions as blast engineer, geologist, production administration, section

head, operator, mineplan engineer, surveyor, and safety health environment (SHE) and most of them are placed as production supervisors.

Based on research findings from various available inputs, D3 Mining Engineering graduates can occupy job positions in the field with the following profiles;

- 1) Surveyor/Assistant survey/foreman in mining exploration activities,
- 2) Group Leader/assistant group leader in Mining activities,
- 3) Technician at Mining Laboratory,
- 4) Assistant Mine Planner (Junior Mine Plan),
- 5) Technical Team at the Mining Service at the Ministry of Energy and Mineral Resources,
- 6) Mine Explosive/Blasting Supervisor/Foreman Mine Drill & Blast,
- 7) Junior supervisor for mining,
- 8) Mining technician in general,
- 9) Sweeping activity technician (Drill & Blast Technician),
- 10) Technician for loading and transporting equipment,
- 11) Management of OHS and Mining Environment,
- 12) Supervisor/Foreman Mine Health & Safety,
- 13) Foreman Mine Operations (production),
- 14) Junior Mine Engineer,
- 15) Geotechnical Engineer Assistant,
- 16) Entrepreneurship or Entrepreneurship in Mining.

From the data on the mining study program in job positions in the field with a profile of D3 graduates, the MBKM curriculum must be able to align the needs according to these competencies. Regulations, policies and placements in MBKM activities are needed, for example internships in industry must be in accordance with the field of work, as well as student exchanges, of course, they must be relevant and universities must make some adjustments for the mining competence.

4 Conclusion

The curriculum is needed in order to achieve the goals in learning achievement. Because the curriculum is one of the vital domains in supporting learning activities. So that the curriculum applied in education must be relevant to the needs. The relevance of the mining vocational education curriculum in the preparation of MBKM, must adapt to technological developments, relevance to learning outcome-based learning system education, preparation of documents related to Curriculum Design, Learning Design and Learning Program Evaluation. Then the curriculum must be continuously analyzed so that it is always relevant to the competencies in the mining work field that is needed by the company today and can reveal a map of mining job positions.

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