



Evaluation of the Air Navigation Technology Study Program Curriculum Based on KKNI and MBKM at Makassar Aviation Polytechnic

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Abstract: This study evaluates the implementation of the KKNI (National Qualifications Framework) and MBKM (Comprehensive Skills Framework)-based curriculum in the Air Navigation Technology Study Program at Makassar Aviation Polytechnic, focusing on its impact on graduate retention in the workforce. Using the CIPP (Context, Input, Process, Product) evaluation model, this quantitative study involved 50 respondents, consisting of current students and alumni. Data were collected through questionnaires and documentation. The results indicate that all four aspects—context, input, process, and product—have a positive and significant impact on graduate retention in the workforce. These findings indicate that the KKNI and MBKM-based curriculum increases the relevance of graduate competencies to industry needs, strengthens partnerships between academia and industry, and enhances graduate readiness for the professional workforce. This study concludes that the implementation of the curriculum has a significant impact on graduates' competitiveness and employability skills in the aviation sector.

Keywords: Devotion, Community, Education

Introduction

Education plays a crucial role in preparing competent human resources to face the rapid developments in science, technology, and global industrial needs. In the context of aviation vocational education, the curriculum must be continually evaluated to remain relevant to the demands of the aviation industry and the dynamics of globalization. The Indonesian National Qualifications Framework (KKNI) and the Independent Learning and Independent Campus (MBKM) policy represent government efforts to strengthen the role of higher education in producing graduates who excel not only academically but also professionally and adaptively to changing work environments.

The Air Navigation Technology Study Program at the Makassar Aviation Polytechnic is a strategic educational institution responsible for producing professionals in the field of air navigation. As a profession-oriented program, its curriculum must integrate technical competencies and soft skills that align with industry standards. However, there are limited empirical studies measuring the effectiveness of implementing KKNI- and MBKM-based curricula in vocational education, particularly in aviation. Therefore, evaluating curriculum implementation is crucial to determine the extent to which it supports the achievement of competencies required by the aviation industry.

Curriculum evaluation serves as a quality assurance mechanism that helps identify strengths, weaknesses, and areas for improvement. The CIPP (Context, Input, Process, Product) evaluation model developed by Stufflebeam provides a comprehensive framework for assessing educational programs based on relevance, resources, implementation, and outcomes. Through this model, this study seeks to assess the extent to which the curriculum design, learning processes, and graduate outcomes of the Air Navigation Technology Study Program align with the objectives of the KKNI (National Qualifications Framework) and MBKM (National Institute of Aviation Management) policies.

Ultimately, this evaluation aims to measure the curriculum's effectiveness in preparing competent, competitive graduates who are absorbed into the aviation workforce. The research findings are expected to provide input for policymakers, educators, and industry stakeholders in refining curriculum design so that vocational education in Indonesia can produce graduates who meet national and international standards.

Theoretical Studies

The curriculum is the heart of the educational process because it plays a role in determining the direction, content, and learning strategies in achieving educational goals. According to Print (2019), curriculum development must be dynamic and contextual to adapt to societal needs and developments in the workplace. In the context of vocational education, the curriculum is oriented not only toward academic achievement but also toward mastering practical skills relevant to industry demands. Therefore, vocational education requires an evaluation model capable of assessing the alignment of curriculum design, the learning process, and graduate outcomes with the needs of the workplace.

The CIPP (Context, Input, Process, Product) evaluation model developed by Stufflebeam (2003) is widely used in educational research as a comprehensive approach to assessing program effectiveness. This model assesses four main dimensions: context, which examines the need for and relevance of the program; input, which includes planning and resources; process, which assesses program implementation; and product, which assesses the results and impact achieved. In vocational education, this model is relevant because it can provide a comprehensive overview of the relationship between policy, implementation, and learning outcomes.

The Indonesian National Qualifications Framework (KKNI) is a competency grading system that connects formal education with the needs of the workforce. Through the KKNI, learning outcomes at each level of education are designed to align with national and international competency standards. Meanwhile, the Independent Learning–Independent Campus (MBKM) policy implemented by the Ministry of Education, Culture, Research, and Technology provides students with the flexibility to study outside their study program or campus, such as through industrial internships, applied research, entrepreneurial projects, and social activities. Both policies aim to produce graduates who are creative, adaptable, and possess cross-disciplinary competencies.

In the context of the Air Navigation Technology Study Program at the Makassar Aviation Polytechnic, the implementation of the KKNI and MBKM-based curriculum is expected to produce graduates with high technical competency, professionalism, and work

readiness. Evaluating curriculum implementations using the CIPP approach is crucial to assess the program's effectiveness in improving learning quality, competency relevance, and alumni absorption in the aviation workforce. Therefore, this study not only provides a theoretical contribution to the development of curriculum evaluation but also has practical implications for improving the quality of vocational education in Indonesia.

Methodology

This study employed a quantitative approach with a descriptive evaluative design. The aim was to assess the effectiveness of the implementation of the KKNI (National Qualifications Framework) and MBKM (National Qualifications Framework)-based curriculum in the Air Navigation Technology Study Program at Makassar Aviation Polytechnic. The evaluation model used was the CIPP (Context, Input, Process, Product) model developed by Stufflebeam, as it is considered capable of providing a comprehensive overview of the relevance, resources, implementation, and outcomes of the educational program.

The study population included active students, alumni, lecturers, and stakeholders involved in the implementation of the study program's curriculum. The sample was drawn using a random sampling technique, with 50 respondents consisting of students and alumni representing the users and beneficiaries of the curriculum. Data were collected through closed-ended questionnaires, documentation, and supporting interviews, designed based on indicators for each component of the CIPP model.

The research instrument was validated through content validity testing by education experts and reliability testing using the Cronbach's Alpha coefficient to ensure data consistency. Data analysis techniques used included descriptive analysis to provide an overview of each evaluation component, as well as inferential analysis in the form of correlation and multiple linear regression to measure the level of influence between variables.

The analysis was conducted using four main components of the CIPP model:

- (1) Context, to assess the curriculum's suitability to the needs of the aviation industry;
- (2) Input, to assess human resources, infrastructure, and institutional policies;
- (3) Process, to evaluate the implementation of KKNI-based learning and MBKM;
- (4) Product, to assess the outcomes and impact of curriculum implementation on alumni competency and retention.

This approach provides a comprehensive view of the success of curriculum implementation and the extent to which the program has met the objectives of aviation vocational education, both academically and professionally.

Result and Discussion

The research results indicate that the implementation of the KKNI (National Qualifications Framework) and MBKM (Comprehensive Skills Framework)-based curriculum in the Air Navigation Technology Study Program at the Makassar Aviation Polytechnic has been successful and has had a positive impact on improving the quality of learning and the relevance of graduate competencies to the needs of the aviation industry.

Based on analysis using the CIPP model, the four evaluation components—context, input, process, and product—showed strong and interrelated results, supporting curriculum effectiveness.

From the context aspect, it was found that the curriculum formulation was aligned with the institution's vision and the needs of the national and international aviation industry. The developed curriculum is competency-based and aligned with the Indonesian National Qualifications Framework (KKNI), ensuring that learning outcomes align with professional standards in air navigation. Furthermore, the MBKM policy provides space for students to develop learning experiences off-campus through industrial internships, applied research, and other collaborative activities that strengthen graduates' competitiveness.

The input aspect demonstrates the availability of qualified human resources, both lecturers and instructors with professional backgrounds in aviation. Educational facilities and infrastructure, such as laboratories, air navigation simulations, and learning technology support, are deemed adequate to support the practice-based education process. Institutional management support is also evident through the development of strategic plans oriented toward quality improvement and collaboration with industry partners.

In terms of process, KKNI (National Qualifications for National Qualifications) and MBKM (National Qualifications for National ... These results align with previous studies (Stufflebeam, 2003) (Oliva & Gordon, 2020) (Print, 2019), which emphasize the importance of continuous evaluation in maintaining the quality and relevance of the curriculum to industry developments and societal needs.

Conclusion

The results of this study indicate that the implementation of the KKNI (National Qualifications Framework) and MBKM (National Qualifications Framework)-based curriculum in the Air Navigation Technology Study Program at the Makassar Aviation Polytechnic has proven effective in improving learning quality, competency relevance, and graduate competitiveness. Based on the evaluation results using the CIPP model, the four components—context, input, process, and product—contribute positively and mutually support the successful implementation of the curriculum.

The context aspect indicates that the curriculum has been designed in accordance with the needs of the aviation industry and national education policies. The input aspect demonstrates adequate human resource support and educational facilities. The process aspect confirms the successful implementation of experiential learning, internships, and collaboration with industry. The product aspect indicates that graduates have a high employment rate and competencies that align with aviation industry standards.

Overall, the results of this study confirm that the implementation of a curriculum based on the KKNI (National Qualifications Framework) and MBKM (National Qualifications Framework) can be an effective curriculum development model in vocational education, particularly in the aviation sector. Continuous evaluation and increased collaboration between educational institutions and industry are necessary to ensure the sustainability of educational quality, adaptation to technological changes, and enhancement of graduate professionalism.

This research is expected to serve as a reference for policymakers and education practitioners in developing a competency-based curriculum model that is relevant to global industry needs and strengthens the competitiveness of vocational education in Indonesia.

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