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Implementation of The *Merdeka Belajar Kurikulum Merdeka* Curriculum to Improve The Quality of Prospective Chemistry Teachers

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Abstract. Curriculum is a plan used to guide teaching and learning activities. This study aimed to identify the alignment of the Chemistry Education Study Program curriculum documents at University X with the *merdeka belajar kurikulum merdeka* (MBKM) policy, evaluate its implementation, and assess lecture and student perceptions regarding MBKM's impact on prospective teachers' competencies. A case study approach was employed, utilizing analysis of curriculum document, observation of course, questionnaires, and interviews. Data collected through triangulation were then analyzed descriptively. The results indicated that the curriculum documents were aligned with the higher education curriculum development guide-MBKM, including the formulation of graduate profiles, learning outcomes, curriculum maps, and course plans. These elements supported prospective teachers in developing competencies relevant to field demands and enabled student participation in MBKM activities. The MBKM implementation in this study program showed active involvement of lecture and students in activities such as '*kampus mengajar*' and '*wirausaha merdeka*', which positively impacted prospective teachers' competencies. Institutional support was a key factor in the program's success. However, areas for improvement remained, particularly in the use of innovative learning methods such as problem based learning, project-based learning, discovery, and inquiry to help enhance prospective chemistry teachers' critical thinking skills.
Keywords: CPL, curriculum, MBKM, graduate profiles

Introduction

The education sector is currently undergoing rapid transformations that are intricately connected with various aspects of life. This shift has been further accelerated by advancements in science and technology. Higher education institutions are expected to produce graduates who are excellent, competitive, adaptive, flexible, productive, and capable of embodying Pancasila values. In other words, higher education must deliver

graduates who meet user demands and possess entrepreneurial skills. One of the critical factors contributing to achieving this goal is the curriculum.

As stipulated in Regulation of the Minister of Education and Culture (Permendikbud) No. 3 of 2020, Article 1, a curriculum is defined as a set of plans and arrangements regarding objectives, content, teaching materials, and methods used as guidelines for organizing learning activities to achieve higher education goals. The higher education curriculum serves as a mandate that must be continually updated to align with evolving needs and advancements in science and technology, as reflected in the expected learning outcomes. Higher education institutions, as producers of educated human resources, must evaluate whether their graduates possess competencies equivalent to the learning outcomes formulated within the framework of the indonesian national qualifications framework (KKNI). Law No. 12 of 2012, Article 35, Paragraph 2 mandates that higher education curricula be developed by each university, referencing the national standards for higher education, encompassing the development of intellectual intelligence, noble character, and skills.

In 2020, the Ministry of Education and Culture (Kemendikbud) introduced MBKM curriculum as a response to the need for competent, adaptive educators ready to tackle real-world challenges. MBKM represents the Indonesian government's initiative to enhance the quality of higher education through more flexible and relevant learning aligned with workplace demands (Purwanto & Risdianto, 2022; Sahreebanu et al., 2022).

The *merdeka belajar kurikulum merdeka* (MBKM) program aims to provide students with broader learning experiences and new competencies through various activities outside their primary study program. This initiative is intended to produce graduates equipped to face the complex challenges of the 21st century. Under MBKM, students have the opportunity to spend one semester (equivalent to 20 credits) engaging in learning activities outside their primary study program at the same university, and up to two semesters (equivalent to 40 credits) in programs at different universities, other study programs, or external institutions (Irvani et al., 2024).

It is imperative for academic institutions at the tertiary level to adjust their curricula and enhance the quality of their learning processes in line with the National Higher Education Standards (SN-Dikti) to support the MBKM program. Universities and study programs must actively develop MBKM curriculum implementations. This challenge can be addressed by redesigning study program curricula to align with MBKM policies. Comprehensive planning of learning activities, innovative teaching methods, and relevant assessment mechanisms are key components. Additionally, graduate profiles and learning outcomes (CPL) must be tailored to the dynamic demands of the job market. An effective MBKM curriculum should provide meaningful learning experiences, facilitate independent study, and involve the entire academic community and other stakeholders in its development and implementation.

In practice, several challenges accompany the implementation of MBKM. Previous studies have identified issues such as unclear educational objectives, lack of implementation guidelines, inadequate resources, and obstacles in curriculum development and external collaborations. Internal factors such as mindset and administrative systems, as well as external factors like the covid-19 pandemic and previous characteristics of Indonesian education, have also influenced MBKM's success (Kholik et al., 2022; Sabriadi & Wakia, 2021; Susetyo, 2020).

Despite these challenges, MBKM offers significant opportunities to optimize the quality of higher education. Research shows that MBKM implementation improves competencies among lecture, students, and educational staff, enhances students' soft and hard skills, and develops 21st-century skills, including communication, creativity, critical thinking, and collaboration (Jufriadi et al., 2022; Nita et al., 2022; Oksari et al., 2022).

The program has also received positive feedback from both students and lectures (Komarudin & Aziz, 2022).

As the forefront of preparing prospective chemistry teachers, the Chemistry Education Study Program must take an active role in implementing the MBKM curriculum. Chemistry education has specific characteristics that require a comprehensive learning approach, integrating theoretical and practical aspects, as well as the ability to connect concepts to everyday life. With a flexible and innovative curriculum, prospective teachers can gain more holistic learning experiences, combining theory and practice with skills relevant to the job market. This will produce graduates who not only master chemical concepts but also possess strong pedagogical competencies to address 21st-century educational challenges (Aydin & Akin, 2022; Oktariani, et.al., 2020).

Given the importance of MBKM implementation in supporting the Chemistry Education Study Program to produce quality prospective teachers, continuous monitoring and evaluation are necessary. These efforts aim to ensure the effectiveness of MBKM curriculum implementation within the Chemistry Education Study Program, providing insights for policymakers regarding its sustainability and improvement. This study seeks to examine the alignment of curriculum documents and their implementation with MBKM policies, as well as lecture and student perceptions regarding MBKM's impact on prospective teachers' competencies. The novelty of this research lies in its focus on linking the MBKM curriculum with the quality of prospective chemistry teachers, a rarely explored aspect. So, this study aimed to identify the alignment of the Chemistry Education Study Program curriculum documents at University X with the MBKM policy, evaluate its implementation, and assess lecture and student perceptions regarding MBKM's impact on prospective teachers' competencies.

Methods

This research employs a case study approach aimed at describing the implementation of the MBKM curriculum in the Chemistry Education Study Program at a university in Riau. The research data was collected through triangulation involving the following methods:

1. Document Analysis: This included reviewing the higher education curriculum development-MBKM guidebook, the chemistry education study program curriculum book, course syllabi (RPS), program policies related to MBKM, and other MBKM implementation documents. The aim was to assess the alignment of the curriculum development and program curriculum documents with existing policies and guidelines.
2. Observation: Observations were conducted on the learning processes within the chemistry education study program to evaluate the practical implementation of the curriculum during lectures.
3. Questionnaires and Interviews: lectures and students in the chemistry education study program were surveyed and interviewed to gain insights into their perceptions of the MBKM curriculum.

Document analysis was carried out based on the development criteria outlined in the MBKM higher education curriculum development guidebook. The questionnaires were designed according to indicators from the MBKM curriculum implementation evaluation guide by the ministry of education and culture (Kemdikbud). Data collected through triangulation were then analyzed descriptively.

Results and Discussion

Based on the analysis of documents, observations, and interviews, the Chemistry Education Study Program at University X has implemented the MBKM curriculum since the 2021/2022 academic year. Prior to its implementation, the program finalized its curriculum

guidebook, which was developed through several stages, including a needs analysis and scientific and technological studies. These steps resulted in the formulation of graduate profiles and study materials, accompanied by workshops and evaluations of the previous curriculum. The graduate profiles include the following roles: chemistry educator, junior educational researcher, and entrepreneur in chemistry education. The program's body of knowledge encompasses three main areas: chemistry science, methodological-pedagogical studies (education science), and other fields relevant to chemistry education. This knowledge framework aligns with related fields in chemistry education at the master's (S2) and doctoral (S3) levels, as well as correlates with the broader chemistry discipline. Thus, the fields of study offered adequately prepare students for higher-level studies or professional teacher training programs (Pendidikan Profesi Guru or PPG). Within the educational taxonomy, chemistry education is categorized as a branch of natural sciences education (IPA), encompassing studies on the composition, structure, dynamics, energy, and basic principles of separation, analysis, synthesis, and characterization of chemical materials. The curriculum includes methodologies for planning, implementing, monitoring, and evaluating education. These methodologies underpin the study materials for curriculum analysis, teaching strategies, educational management, lesson planning, learning evaluations, chemistry assessment, chemistry education challenges, and microteaching. Methodological studies on teaching and learning various aspects of chemistry aim to enhance the quality of chemistry education expertise.

The structure of this body of knowledge and its alignment with learning outcomes follows the recommendations of the finalization workshop on undergraduate learning outcomes by the Chemistry Education Division of the Indonesian Chemistry Association (Himpunan Kimia Indonesia), a national body overseeing chemistry study programs. Chemistry Education Program (S1) at University X, under the Faculty of Education, aims to produce competent chemistry teachers. Therefore, students must be equipped with knowledge of both chemistry and education. The study materials are based on competencies adhering to a modified technological pedagogical content knowledge (TPACK) model.

After defining graduate profiles and study materials, the learning outcomes for graduates (CPL) were formulated. The CPL was developed with input from stakeholders, scientific consortiums (e.g., the Indonesian Chemistry Association), advancements in science, and evaluations of the previous curriculum. It also adheres to the National Higher Education Standards (SN-Dikti) and KKNI descriptors. Based on the CPL, courses and credit weights were determined, along with a curriculum map and course matrix. All processes and documents are clearly outlined in the analyzed curriculum guidebook. The total credits required for graduation are 144, with a maximum duration of 14 semesters. Students complete 90 credits within the program, with 40–60 credits eligible for completion outside the program. The courses are categorized as follows: general compulsory courses (MKWU) yaitu: islamic religious education, pancasila, civics, and bahasa. University compulsory courses: worship and social interaction, islam and science, english, data and technology literacy, and basic entrepreneurship. Faculty compulsory courses: foundations of education, ethics and educational professions, student development, educational statistics, and teaching practice (KPLP). Program courses: These include compulsory courses and electives course.

MBKM courses are tailored to student interests, such as research, entrepreneurial activities, or teaching assistance. Students participating in MBKM programs outside the department can convert these activities into 20 credits each. The curriculum map shows that students can participate in nine MBKM activities organized by the Ministry of Education, Culture, Research, and Technology (Kemendikbudristek). However, based on the CPL and chemistry education fields, students are more strongly recommended to engage in

programs like kampus mengajar, entrepreneurship projects, MSIB (internships and independent studies), student exchange programs, and teaching assistance.

The analysis concluded that the curriculum guidebook preparation process aligns with the MBKM higher education curriculum development guidebook. Overall, the Chemistry Education Study Program's curriculum at University X meets the necessary criteria and is ready for implementation. In addition to the curriculum map and course distribution, the guidebook includes RPS, task designs, and assessment plans for each course. An analysis of the course planning documents confirms compliance with Permendikbud No. 3 of 2020 and SN-DIKTI article 12. The detailed results of the RPS document analysis are summarized in the following Table 1.

Table 1. Results of the RPS Document Analysis

Aspect Analyzed	Analysis Results
Completeness of the RPS Document	The RPS document must include at least: the name of the study program, course name and code, semester, credits, assigned lecturer, CPMK, expected final competencies at each learning stage to achieve the graduate learning outcomes, study materials related to the competencies to be achieved, learning methods, allocated time to achieve competencies at each stage, student learning experiences outlined in the description of tasks to be completed over one semester, criteria, indicators, and grading weights; and the list of references used.
Planned Learning Characteristics	Interactive, holistic, scientific, contextual, thematic, effective, and collaborative.
Learning Methods	PBL, PjBL, inquiry, cooperative learning, discussion, lectures, question-and-answer sessions, and case studies.
Assessment Principles	Educational, authentic, objective, accountable, and transparent.
Assessment Domains	Attitudes, general skills, specific skills, and knowledge.
Assessment Techniques	Tests, observations, performance evaluations, portfolios, and questionnaires, with final grades being an integration of the techniques and instruments used.

Implementation of the MBKM Curriculum

In addition to analyzing curriculum documents, this study also conducted observations and interviews regarding the learning processes within the Chemistry Education Study Program at University X. Observations were carried out to assess the alignment between the RPS planning documents and their implementation, as well as to examine the forms of MBKM implementation in the learning process. Data collection during observations included learning methods, learning characteristics, assessment techniques, assessment domains, student participation, and the involvement of both students and lecture in MBKM programs. The detailed results of observations and interviews on the implementation of the MBKM curriculum in the learning process are as follows.

Table 2. Alignment between RPS planning documents and MBKM

Criteria	Planning Documents	Implementation
Planned Learning Characteristics	Interactive, holistic, scientific, contextual, thematic, effective, and collaborative.	Interactive, contextual, scientific, effective, and collaborative.
Learning Methods	PBL, PjBL, inquiry, Cooperative Learning, discussions, lectures, Q&A sessions, and case studies.	Cooperative Learning, discussions, lectures, Q&A sessions, and case studies.
Assessment Principles	Educational, authentic, objective, accountable, and transparent.	Educational, authentic, objective, accountable, and transparent.

Assessment Domains	Attitudes, general skills, specific skills, and knowledge.	Attitudes, general skills, specific skills, and knowledge.
Assessment Techniques	Tests, observations, performance evaluations, portfolios, and questionnaires, integrated into final grades.	Tests, observations, portfolios, and performance evaluations.
Involvement in MBKM Programs	Facilitates students' participation in MBKM programs.	Actively involved in MBKM programs organized by the Ministry of Education and Culture (Kemendikbud).

Based on the interview results, it was found that this study program actively participates in MBKM activities outside the department. Several forms of the program's involvement in MBKM activities are outlined in the Table 3.

Table 3. Program Study Involvement in MBKM Activities

Year	Type of Involvement
2022	1. Hosted students from the independent student exchange program (*pertukaran mahasiswa merdeka* - PMM) from Universitas Muhammadiyah Sidoarjo. 2. One lecture member served as a mentor for the PMM program.
2023	1. Two lectures members served as field supervisors *(*DPL*)* for the kampus mengajar batch 5. 2. Two students participated in the independent etrepreneurial program (*wirausaha merdeka*).
2024	1. One lecture served as a mentor for the independent entrepreneurial program. 2. One lecture served as a DPL for the teaching campus program. 3. Two students participated in the independent entrepreneurial program (*wirausaha merdeka*). 4. Six students joined the kampus mengajar batch 7. 5. One student participated in the international teaching assistance program.

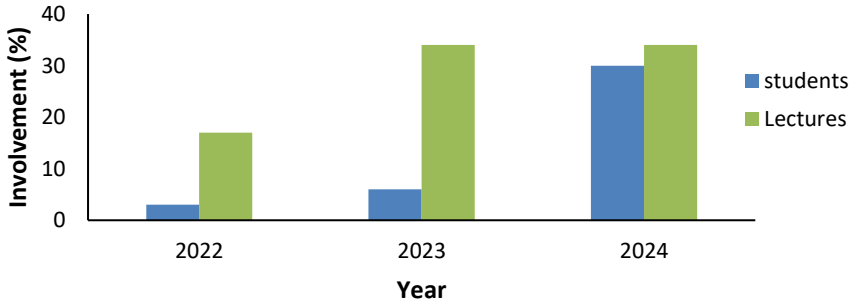

Figure 1. Percentage of lectures and students involvement in MBKM programs outside the department

Figure 2. Percentage of lectures and students involvement in MBKM programs outside the department over the last three years

Lecture and Student Perceptions of the MBKM Curriculum

A questionnaire was distributed to lecture and students to assess their perceptions of the MBKM curriculum concerning the following aspects: Understanding of MBKM, Institutional support for MBKM, alignment of the study program curriculum with MBKM olicies, challenges in implementing, benefits of MBKM, and the impact of activities on the quality of prospective chemistry teachers. Results of the questionnaire in terms of understanding MBKM policies, the data revealed that 100% of lecture reported a very comprehensive understanding of all aspects of the MBKM curriculum. Among students, 60% indicated full understanding, 25% reported a good understanding, 10% expressed moderate understanding, and 5% admitted to having limited. The detailed profiles of lecture and student understanding of MBKM policies are presented in the Figure 3.

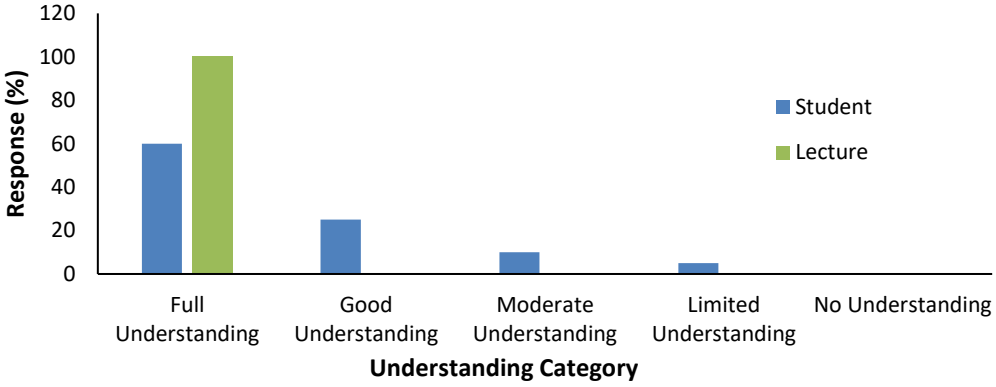

Figure 3. Percentage of lecture and student responses regarding understanding of MBKM policies

For institutional support aspect, the data indicates that the majority of lecture and students perceive strong institutional support for MBKM policies: 100% of lecture expressed that the institution provides very strong support for MBKM implementation. Among students, 80% indicated very supportive, while the remaining 20% acknowledged supportive. This data demonstrates the institution's commitment to fostering an environment conducive to MBKM's success. The detailed profile of lecture and student perceptions regarding institutional support is presented in the Figure 4.

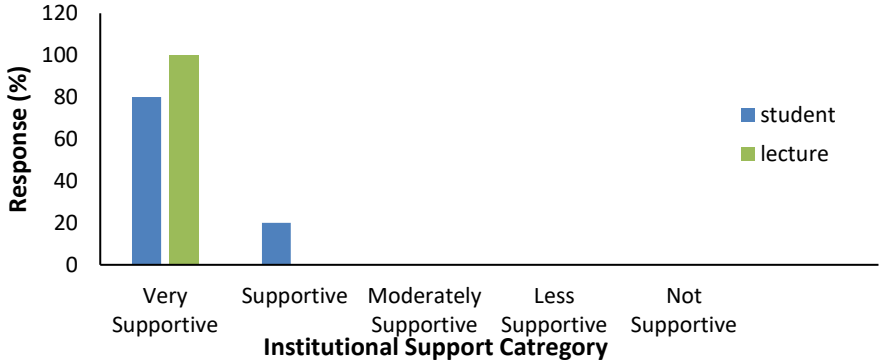

Figure 4. Percentage of lectures and students responses regarding institutional support

The data reveals that most lecture members and students perceive the curriculum to be aligned with MBKM policies. Among lecture, 67% stated that the curriculum aligns well with MBKM policies, while 33% found it moderately aligned. From the students' perspective, 73% expressed that the curriculum is very well aligned, 20% stated it aligns adequately, and 7% mentioned it is moderately aligned. These findings indicate that the study program curriculum is generally considered to be in accordance with MBKM requirements, although

some areas may benefit from further adjustments. The detailed profile of lecture and student perceptions regarding this alignment is illustrated in the Figure 5.

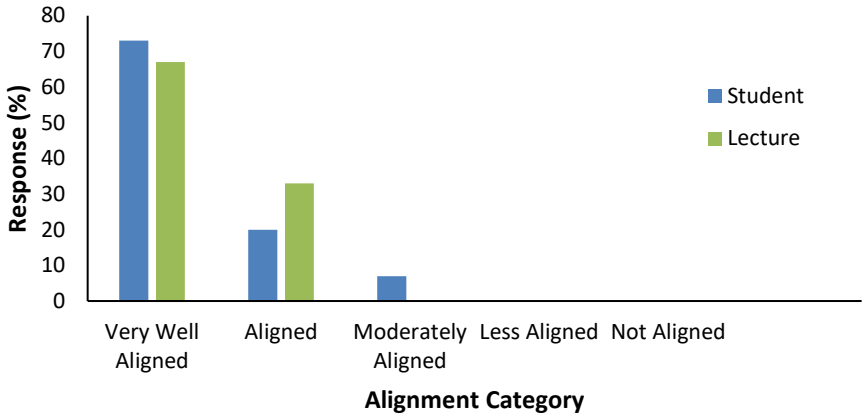

Figure 5. Percentage responses regarding the alignment of study program curriculum with MBKM policies

Challenges in implementing MBKM policies,the data indicates that lecture and students have differing experiences regarding the challenges of implementing MBKM policies. Among lecture, half (50%) reported that the implementation process was "moderately difficult," while the other 50% found it "not difficult." On the other hand, students provided a slightly more varied response. While 43% of students found the implementation "not difficult," 50% considered it "moderately difficult," and 7% described it as "difficult." These findings suggest that while the challenges are manageable for most participants, some students and lecture encounter obstacles that may require additional institutional support to address effectively. The detailed profile of perceptions is illustrated in the Figure 6.

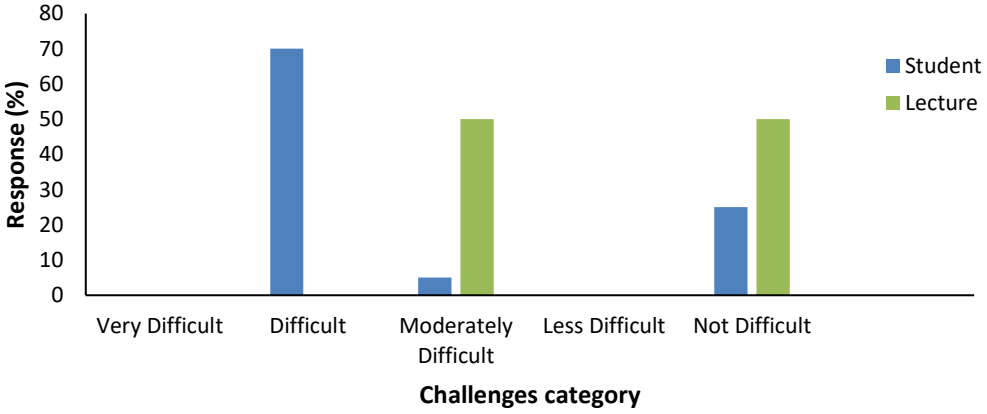

Figure 6. Percentage responses regarding challenges in implementing MBKM policies

Benefits of MBKM policies for competency improvement, the data shows that both lecture and students perceive MBKM policies as highly beneficial for enhancing competencies. Among lecture, 83% stated that the policies are "very beneficial," while 17% rated them as "beneficial." Similarly, 90% of students expressed that the policies are "very beneficial," and 10% indicated they are "moderately beneficial." These findings underscore the significant positive impact of MBKM on developing essential skills and knowledge. The detailed profile of lecture and student perceptions regarding the benefits of MBKM policies for competency improvement is presented in the Figure 7.

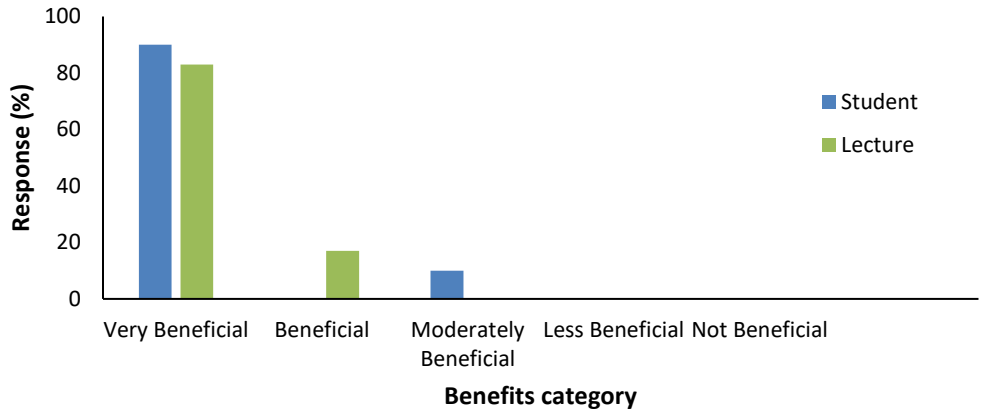

Figure 7. Percentage responses regarding the benefits of MBKM policies for competency improvement

Impact of MBKM activities on the quality of prospective chemistry teachers, the data indicates that MBKM activities are perceived to have a significant impact on the quality of prospective chemistry teachers. Among lecture, 100% stated that MBKM activities have a "very significant impact." Similarly, 90% of students reported a "very significant impact," while the remaining 10% indicated that these activities have a "significant impact." These findings highlight the substantial role of MBKM programs in improving both technical and pedagogical competencies. The detailed profile of lecture and student perceptions regarding the impact of MBKM activities on the quality of prospective chemistry teachers is presented in the Figure 8.

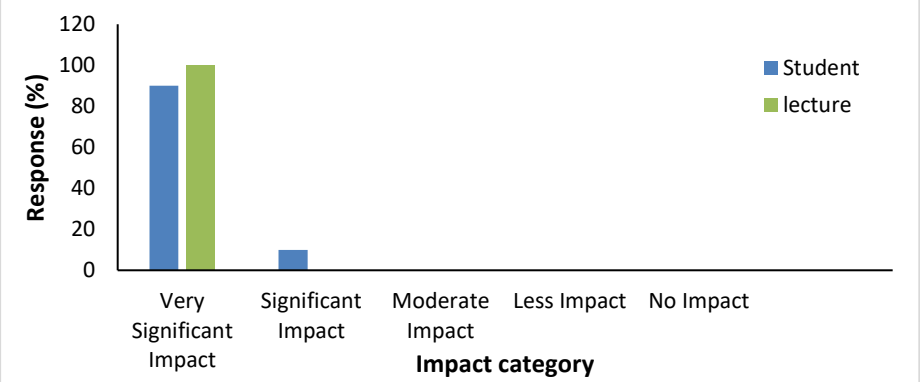

Figure 8. Percentage responses regarding the impact of MBKM activities on the quality of prospective chemistry teachers

This study aims to identify the implementation of the MBKM program within the Chemistry Education Study Program at University X, particularly in terms of curriculum document preparation, MBKM execution, and lecture and student perceptions of the program. The analysis reveals that the MBKM curriculum structure at the Chemistry Education Study Program of University X has been systematically developed through various stages, including needs analysis, graduate profile determination, and the preparation of semester learning plans RPS that align with the *SN-DIKTI*, the Indonesian *KKNI*, and the professional needs of chemistry teachers.

Additionally, the curriculum has been tailored to the expected graduate profiles, which include becoming a chemistry educator, a junior researcher in the field of education, and an entrepreneur in educational chemistry. The formulation of graduate profiles and study materials forms the foundation for the development of CPL as well as the curriculum map,

which allows students to participate in MBKM programs outside their study program for 40–60 credits. These credits can be converted from nine types of MBKM activities, such as student exchanges (PMM), teaching campus programs (*kampus mengajar*), and independent entrepreneurship programs (*kewirausahaan merdeka*) (Junaidi, 2020). This indicates that the MBKM curriculum at University X has been adapted to align with the principle of flexibility, as mandated by Regulation of the Minister of Education and Culture (Permendikbud) No. 3 of 2020 and the higher education curriculum development-MBKM Guidebook. In addition to providing students with the opportunity to choose, this approach also serves as a means to train students in decision-making skills. It encourages them to make decisions that align with their personal challenges and needs, thereby enabling them to actualize their potential (Jufriadi et al., 2022).

Furthermore, in the development of the curriculum documents, the Chemistry Education Study Program at University X has incorporated input from various stakeholders, including the Indonesian Chemistry Association (*Himpunan Kimia Indonesia*) and evaluations of the previous curriculum. This approach ensures that the designed CPL align with the needs of modern chemistry education and graduate competency standards. This collaborative approach reflects the principle of stakeholder involvement, emphasizing the importance of input from multiple parties in producing graduates who are adaptive and competent in their fields. Engaging various stakeholders in the curriculum development process is one of the key strategies to align the curriculum with real-world demands (Nurhusni et al., 2023).

In addition to the curriculum guidebook, alignment is also evident between the guidebook and the RPS, task designs, and evaluation plans developed by the course instructors. According to Permendikbud No. 3 of 2020 and SN-DIKTI article 12, the RPS must include the following key components: the name of the study program, course name and code, semester, credit hours (SKS), assigned instructor, CPMK, the expected final competencies for each learning stage to meet the graduate learning outcomes, study materials related to the competencies to be achieved, learning methods, time allocated t'o achieve competencies at each learning stage, student learning experiences outlined in the description of tasks to be completed over one semester, criteria, indicators, and grading weights; and the list of references used. Additionally, the planning documents show that the characteristics of the learning process, procedures, and assessment techniques are aligned with established standards and guidelines.

The alignment between the curriculum documents and the learning planning documents with existing guidelines, standards, and policies will undoubtedly have a positive impact on achieving educational goals and graduate profile outcomes. As highlighted in previous studies, one of the key factors in successfully achieving educational or learning objectives is the consistency and alignment between planning, standards, and policies (Care et al., 2018; Meij & Merx, 2018; Ziebell & Clarke, 2018).

The results of observations and interviews indicate that the implementation of MBKM in the learning process within the Chemistry Education Study Program has successfully emphasized the use of interactive, contextual, and collaborative learning methods, such as PjBL, PBL, and inquiry-based learning. However, in practice, some methods outlined in the RPS could not be fully implemented due to time constraints and certain conditions. As a result, while some learning sessions have adopted PjBL and PBL methods, the process is still predominantly dominated by lectures, discussions, and question-and-answer sessions. This highlights the need for lecture members to consistently apply innovative learning models that can help students enhance their critical thinking skills. Developing these skills is not an instantaneous process; rather, it requires consistent practice to become a habit. Ultimately, this will enable students to use their critical thinking abilities effectively in various situations and contexts (Oktariani, et al., 2020). This is consistent with previous research, which has demonstrated that critical thinking skills can be developed through the

use of innovative learning methods such as PjBL, discovery learning, PBL, inquiry-based learning, and others (Oktariani & Febliza, 2019; Redhana, 2019; Stehle & Peters-Burton, 2019; Tiring, 2020).

The alignment between planning documents and the actual learning process also requires attention from lecturers, as it significantly influences students' learning outcomes and CPMK. This alignment further impacts the attainment of CPL and the fulfillment of the graduate profile. Any discrepancies between the curriculum and its implementation in learning could disadvantage students, making it essential to promptly address and rectify such inconsistencies (Oktariani, et al., 2020; Porter, 2002).

Lecture and students in the Chemistry Education Study Program at University X have been actively involved in both on-campus activities and external MBKM programs, such as *kampus mengajar*, p*ertukaran mahasiswa merdeka*, *asistensi mengajar*, and *wirausaha merdeka*. Over the past three years, there has been an increase in lecture and student participation in MBKM programs outside the university. This growth can be attributed to the strong institutional support for MBKM implementation. Interviews revealed that the lecture leadership, specifically the Lecture administration, provides preparation sessions for both lecturers and students regarding the MBKM programs offered by the Ministry of Education and Culture (Kemendikbud). Additionally, the study program curriculum facilitates the conversion of MBKM activities outside the department into equivalent courses aligned with CPMK, ensuring no issues arise related to credit conversion. Among the most popular MBKM programs are *kampus mengajar* and *asistensi mengajar*, which align with the graduate profile of Chemistry Educators, as well as *wirausaha merdeka*, which suits the graduate profile of entrepreneurs. Furthermore, additional support is provided in the form of rewards and recognition for lecture and students who successfully participate in MBKM programs. This significantly motivates both lecturers and students to engage in these initiatives.

In implementing the MBKM program, the majority of lecture and students agree that this program provides significant benefits in enhancing pedagogical skills, understanding of chemistry content, and students' adaptability in a professional context. The implementation of MBKM at University X is considered to have a significant impact on the quality of prospective chemistry teachers. Through internships, teaching campuses, and assistance activities, students are able to develop relevant teaching skills while simultaneously strengthening the technical and non-technical competencies required in the teaching profession (Irawan & Suharyati, 2023; Suastika et al., 2022). This aligns with previous findings, which show that the MBKM program has a positive impact on improving both hard and soft skills, as well as the ability to think critically and creatively in solving problems (Jufriadi et al., 2022; Lestari et al., 2024; Sahreebanu et al., 2022; Winaryati, 2018).

Conclusion

The curriculum document for the Chemistry Education Program at University X has been developed in accordance with the guidelines set by 'kemendikbudristek' regarding the MBKM curriculum and meets the criteria outlined in the Minister of Education and Culture Regulation No. 3 of 2020. This reflects the readiness of the study program to support students in gaining relevant off-campus experiences aligned with professional needs. In practice, the MBKM program in the Chemistry Education Program has been implemented, although some methods such as PBL dan PjBL have not yet been fully applied in field practice. Lecture members have, however, adopted interactive, scientific, and collaborative approaches, which align with the learning characteristics desired in the MBKM policy. Students are also encouraged to participate in MBKM programs both on and off-campus, such as the '*kampus mengajar*', '*wirausaha merdeka*, and '*asistensi mengajar*

internasional'. This is evident from the high percentage of lecture and student involvement in MBKM programs over the past three years. The majority of lecture and students understand and fully support the MBKM policy. Strong institutional support plays a crucial role in ensuring the success of MBKM implementation, as reflected in the perception of most lecture and students who feel supported in carrying out the program. MBKM has a significant impact on improving the competencies of prospective chemistry teachers, both in technical and non-technical aspects. Through practical activities such as *'kampus mengajar', 'wirausaha merdeka*, students have the opportunity to develop teaching, communication, collaboration, and classroom management skills. This contributes to the preparation of prospective chemistry teachers who are better equipped to face the professional demands in the education field. Overall, lecture and students agree that the MBKM program supports the development of competencies relevant to the workforce, thus improving the quality of graduates as competent prospective chemistry teachers.

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