

Analysis of Factors Influencing Students' Self-Leadership: A PLS-SEM Approach in the MBKM Program and Industrial Internships

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ABSTRACT

Purpose - This study aims to examine the factors influencing students' self-leadership, particularly through participation in the *Merdeka Belajar Kampus Merdeka* (MBKM) program and an industrial internship. Therefore, this study seeks to address this gap by analyzing the role of MBKM and industrial internship experiences in enhancing students' self-leadership.

Methodology - This study employed a quantitative approach using Partial Least Squares Structural Equation Modeling (PLS-SEM) in SmartPLS 4.0. Data were collected using a previously validated closed-ended questionnaire. The study population consisted of students at Sebelas Maret University enrolled in the MBKM program. The sampling technique employed was convenience sampling. A total of 115 respondents were recruited for the study.

Findings - This study confirms several factors that appear to influence students' self-leadership. A direct relationship confirms that both the MBKM program and industrial internship programs can enhance students' self-leadership. Other findings indicate an indirect relationship whereby the MBKM program influences self-leadership through the industrial internship.

Contribution - This study provides new insights into the factors that enhance students' self-leadership. The findings indicate that the *Merdeka Belajar Kampus Merdeka* (MBKM) program, designed to provide real-world experience through direct workplace engagement, has proven effective in enhancing students' self-leadership skills.

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INTRODUCTION

The era of digital disruption and global economic uncertainty demands that individuals possess capabilities that go beyond mere technical competence. The ability to lead oneself, set goals, regulate behavior, and maintain motivation independently is becoming an increasingly critical competence in the modern workplace s. This ability is known in the literature as self-leadership, defined as a comprehensive process through which individuals influence themselves to establish the direction and motivation required to carry out tasks, whether naturally motivating or not (Kim et al., 2024; Manz, 1986). This construct operates through three main strategies: (1) behavior-focused strategies, encompassing self-goal setting, self-observation, self-reward, and self-cueing; (2) natural reward strategies, which involve tapping into intrinsic motivation so that tasks become naturally enjoyable; and (3) constructive thought strategies, which involve building a positive mindset through constructive self-talk and visualization of success. (Harunavamwe et al., 2020; Neck et al., 2023; Pursio et al., 2025). Cross-disciplinary research consistently demonstrates that self-leadership is positively correlated with performance, commitment, creativity, resilience to stress, and an individual's psychological well-being. (Harari et al., 2021; Naveed et al., 2026; Tenschert et al., 2025).

Although self-leadership has been shown to offer wide-ranging benefits, this ability does not develop automatically. However, it is influenced by an individual's experience, education, and the quality of their environment. Research conducted by Pursio et al. (2025), which reviewed 13 studies from various countries, found that self-leadership is an internal skill that improves with increased real-world work experience and educational attainment; individuals exposed to real responsibilities and working in supportive environments tend to demonstrate higher self-leadership capacity. These findings align with those of Naveed et al. (2026), who empirically demonstrated that individuals with high self-leadership are better able to manage work demands proactively, thereby achieving better performance. Furthermore, Kim et al. (2024) confirm that learning programs grounded in real-world work experience, such as employee development programs in large companies that emphasize learning autonomy, self-directed goal-setting, and direct workplace feedback, have proven effective in empowering individuals to develop their self-leadership. Pursio et al. (2025) specifically recommend that the development of self-leadership begin at the pre-employment education stage, as self-leadership is a skill that can be learned and strengthened through planned interventions rather than passively acquired upon entering the world of work. Previous research has shown that self-leadership is important for students as it can improve academic performance. (Jamaluddin et al., 2025).

In Indonesia, the need to develop students' self-leadership skills is increasingly urgent, as the gap between university graduates' competencies and labor market needs remains a structural issue. In response, the Ministry of Education, Culture, Research, and Technology launched the *Merdeka Belajar Kampus Merdeka* (MBKM) policy in 2020, which grants students the right to undertake learning outside their degree programs for up to three semesters, including through industrial placement schemes. (Bhakti et al., 2022; Sopiansyah et al., 2022; Susilowati & Prameswara, 2025). The MBKM program is explicitly designed to equip students with real-world work experience, develop professional competencies, and foster independence and adaptability, core elements of self-leadership (Baharuddin, 2021). Within this framework, industrial internships represent one of the most strategic forms of MBKM activity, as they place students directly within a real-world work environment characterized by demands, autonomy, and supervision factors that have the potential to act as catalysts for the development of self-leadership (Pongsapan et al., 2024). Thus, the MBKM program and the industrial internship within it theoretically form a causal chain that influences students' self-leadership: the MBKM program as a facilitating policy, industrial internship as a mediating real-world work experience, and self-leadership as the expected outcome of the competencies to be developed.

Although the MBKM program has been running since 2020 and industrial internships have become one of the most popular programs among students, empirical studies specifically examining the causal relationship between the MBKM program, industrial internships, and students' self-leadership remain very limited. Previous research on MBKM has generally focused on evaluating student satisfaction with the

program or on general improvements in technical competencies (Arjanto et al., 2022; Maulana, 2022; Panjaitan et al., 2022; Salim et al., 2022), without examining self-leadership as a standalone outcome construct. On the other hand, existing international studies on self-leadership, which focus on different contexts, examine professionals in hospital settings; discuss it within the context of corporate human resource development; measure it among nursing staff in Pakistan; and examine it within organizational leadership development programs (Kim et al., 2024; Naveed et al., 2026; Pursio et al., 2025; Tenschert et al., 2025). There remains a limited body of research that empirically tests whether the MBKM program influences students' self-leadership, whether industrial internship within the MBKM program influences self-leadership, and whether industrial internship mediates the relationship between the MBKM program and students' self-leadership. This empirical gap serves as both the academic foundation and the justification for the proposed research.

Based on the above, this study aims to empirically test the influence of the MBKM program and industrial internship on the self-leadership of students at Sebelas Maret University who have participated in the MBKM program. Specifically, this study tests four hypotheses: (1) the MBKM program has a positive effect on the implementation of industrial internship; (2) the MBKM program has a positive effect on students' self-leadership; (3) industrial internship has a positive effect on students' self-leadership; and (4) industrial internship mediates the effect of the MBKM program on students' self-leadership. This study fills an empirical gap in the literature whilst addressing the recommendations of Pursio et al. (2025) and Kim et al. (2024) to examine self-leadership within the context of pre-employment education. In practical terms, the research findings are expected to provide evidence-based recommendations to higher education institutions on optimizing the MBKM program, to the Minister for Higher Education, Research and Technology, and higher education institutions on refining internship implementation guidelines, and to industry partners on designing an internship ecosystem conducive to the development of students' self-leadership as preparation for entering an increasingly complex and competitive job market.

METHODOLOGY

Research Design

This study employs a quantitative approach, using a closed-ended questionnaire for data collection. This study aims to examine the relationship between participation in the *Merdeka Belajar Kampus Merdeka* (MBKM) program, industrial internship (MP), and self-leadership (SL). Based on a literature review of prior studies, the proposed research model is presented in Figure.

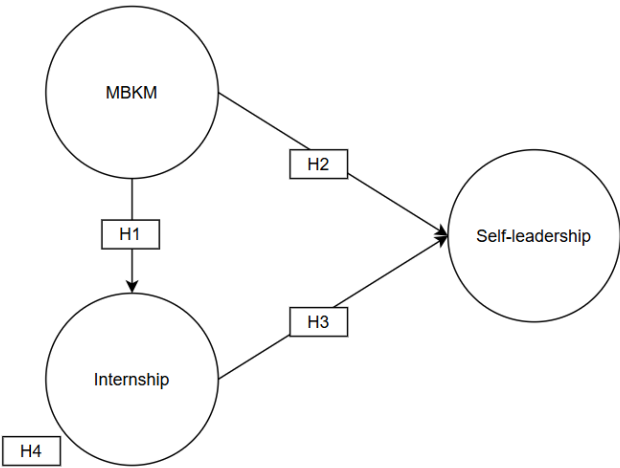


Figure 1. Research Model

The study population comprised all students at Sebelas Maret University participating in the *Merdeka Belajar Kampus Merdeka* (MBKM) program, whilst the study sample consisted of undergraduate (S1) students who had participated in the program. Furthermore, given the complex research model with several latent

constructs, data analysis was conducted using the Partial Least Squares Structural Equation Modeling (PLS-SEM) method.

Research Instrument

This study adopted the instrument from a previous study. Validity and reliability testing were carried out on the questionnaire, which originally consisted of 27 statements; following this testing phase, 20 statements were found to be valid and reliable. During the instrument testing phase, the data were analyzed using SPSS version 25. Items with a calculated r-value lower than the table r-value (0.576) were deemed invalid and removed from the instrument. Subsequently, reliability testing was conducted by examining Cronbach’s alpha, which was 0.676. Based on these results, it can be concluded that this research instrument is sufficiently reliable and suitable for use in the study. The details of the research instrument are presented in Table 1

Table 1. Research Instrument

Variable	Dimension	Source
Self-leadership	Dimensions Behavioral Strategies Dimensions of Cognitive Strategies Dimensions of Natural Reward Strategies	(Harunavamwe et al., 2020)
Merdeka Belajar Kampus Merdeka (MBKM)	Dimensions Technical Dimensions of Learning Process Dimensions of Learning Evaluation	(Kamalia & Andriansyah, 2021; Puspaningtyas & Dewi, 2020)
Industrial Internship	Individual Attitude and Initiatives Organizational Supervision Employability Skills Development Attitude towards future career	(Bawica, 2021)

Participants and Data Collection

This study used a population of students at Sebelas Maret University (UNS) who had participated in the *Merdeka Belajar Kampus Merdeka* (MBKM) program in 2023 and 2024. The sampling technique used was convenience sampling, a non-probability sampling method in which the researcher selects respondents directly, or respondents voluntarily participate in the study (Stratton, 2021). A total of 115 respondents were sampled, comprising 22 males and 93 females. All respondents were informed that their responses would be kept confidential. Data collection was conducted using a closed-ended questionnaire distributed via Google Forms. The research instrument employed a 1–5 Likert scale, with response options ranging from ‘strongly disagree’ to ‘strongly agree’.

Data Analysis

The Partial Least Squares–Structural Equation Modeling (PLS-SEM) analysis technique was selected in this study to evaluate the role of the *Merdeka Belajar Kampus Merdeka* (MBKM) program and industrial internship in enhancing students’ self-leadership, whilst also measuring the predictive power of these variables. The PLS-SEM method is now widely used and has become a popular approach in various fields of research, including education (J. Hair et al., 2014).

The approach used in SEM is causal-predictive, emphasizing the ability of structured statistical models to explain causal relationships between variables (Sarstedt et al., 2017). Using PLS-SEM, this study can test the proposed conceptual model and hypotheses more accurately and validly, and provide a comprehensive

understanding of the interactions and influences among variables, particularly regarding the contributions of the MBKM program and industrial internship to the enhancement of students' self-leadership. Data analysis was conducted using SmartPLS software version 4.0. Testing included the outer model, inner model, and hypothesis testing set at a significance level (alpha) of 5%, with a criterion of a T-statistic ≥ 1.96 (Hair et al., 2019).

FINDINGS

Outer Model

In the initial stage of this study, an instrument validation test was conducted to assess each indicator's ability to represent the variables under investigation. The test results showed that all indicators had factor loadings above the recommended minimum threshold of 0.600 (see Table 2). This indicates that the instruments used met the criteria for suitability for further analysis (Nasution et al., 2020).

Subsequently, internal reliability testing was carried out to ensure the consistency of the instruments using two measures, namely Cronbach's alpha (α) and Composite Reliability (CR). The analysis results show that the CR values range from 0.896 to 0.930, whilst the Cronbach's alpha values range from 0.869 to 0.916, as presented in Table 2. These findings indicate that all variables met the recommended threshold values and can therefore be deemed reliable (J. F. Hair, Risher, et al., 2019; Valentini & Damasio, 2016).

Table 2. Construct Reliability and Convergent validity

Variables	Item	Outer Loading	Cronbach's Alpha (α)	Composite Reliability (CR)
MBKM	MB1	0.631	0.888	0.908
	MB2	0.733		
	MB3	0.666		
	MB4	0.627		
	MB5	0.737		
	MB6	0.760		
	MB7	0.634		
	MB8	0.741		
	MB9	0.699		
	MB10	0.627		
	MB11	0.690		
Industrial Internship	MP1	0.607	0.916	0.930
	MP2	0.719		
	MP3	0.726		
	MP4	0.671		
	MP5	0.671		
	MP6	0.796		
	MP7	0.767		
	MP8	0.718		
	MP9	0.797		
	MP10	0.853		
	MP11	0.787		
Self-Leadership	SL1	0.755	0.869	0.896
	SL2	0.789		
	SL3	0.802		
	SL4	0.662		
	SL5	0.604		
	SL6	0.663		
	SL7	0.670		
	SL8	0.649		
	SL9	0.690		

Furthermore, only one Average Variance Extracted (AVE) value obtained in this study was below 0.5, indicating a relatively high level of average error in the indicators. Nevertheless, this condition is still tolerable as long as the Cronbach's alpha and Composite Reliability values are above 0.6 (Fornell & Larcker, 1981; Valentini & Damasio, 2016).

Inner Model

The purpose of the internal model testing in this study is to evaluate the model's ability to explain the relationships between latent variables. This testing was conducted by examining the R-squared (R^2) value, specifically the Adjusted R-squared, as recommended by Hair et al. (2019). Based on the analysis results presented in Table 3, the self-leadership variable has an adjusted R-squared of 0.541, indicating that the independent variables explain a significant portion of the variation in self-leadership. Meanwhile, the industrial internship variable has an R-square value of 0.458. These findings indicate that the R-squared values for each variable fall within the moderate category, thus demonstrating that the model has a fairly good predictive ability (J. F. Hair, Risher, et al., 2019). Consequently, the model used in this study demonstrates adequate relevance and a strong ability to predict relationships among variables.

Table 3. R-Squared

Variable	R-square	R-square adjusted
MP	0.463	0.458
SL	0.549	0.541

Having evaluated the structural model used in this study, the next step is to test the model's goodness of fit. This test was conducted by considering the SRMS, NFI, and Chi-square values, with cut-off points of SRMS < 0.100, NFI < 0.900, and Chi-square > 0.900. The results show that the SRMS, NFI, and Chi-square values are below the specified thresholds listed in Table 4; therefore, these findings confirm that the model proposed in this study is a good fit.

Table 4. Goodness of Fit

	Saturated model	Estimated model
SRMR	0.079	0.079
d_ULS	3.126	3.126
d_G	1.608	1.608
Chi-square	869.462	869.462
NFI	0.642	0.642

Multicollinearity was then tested in this study by examining the VIF values. The VIF values obtained were less than 3.00, indicating that this study does not suffer from multicollinearity (Table 5).

Table 5. VIF Value

	MB	MP	SL
MB	-	1.000	1.863
MP	-	-	1.863
SL	-	-	-

In this study, VIF values below 3 (Table 5) indicate that the variables MBKM, Industrial Internship, and Self-Leadership are conceptually related but remain empirically distinct constructs. The level of correlation between the variables is not high enough to cause multicollinearity; consequently, each variable can represent a distinct dimension within the research model. Thus, the structural model satisfies the assumption of freedom from multicollinearity, allowing path coefficients to be estimated accurately and the results of tests on the relationships between variables to be interpreted reliably.

Hypothesis Testing

Hypothesis testing encompasses two types: direct relationships and mediated relationships. The variables used include MBKM, industrial internship, and self-leadership (see Table 6 and Figure 2).

Table 6. Hypothesis testing

Hypothesis		Path coefficient	T- statistics	P-values	Significance
H1	MB -> MP	0.681	9.763	0.000	Significance
H2	MB -> SL	0.446	5.082	0.000	Significance
H3	MP -> SL	0.361	3.777	0.000	Significance
H4	MB -> MP -> SL	0.246	3.260	0.001	Significance

The research findings for Hypothesis 1 indicate that student participation in the MBKM program has a significant effect on the implementation of industrial internship, with a t-statistic of 9.763 and a p-value of 0.00. This positive relationship suggests that the implementation of the MBKM program by higher education institutions can enhance students' effectiveness in undertaking industrial internships. Furthermore, Hypothesis 2 was confirmed as significant (t-statistic = 5.082; p-value = 0.00), indicating that student participation in the MBKM program enhances students' self-leadership. Regarding Hypothesis 3, the analysis shows a positive and significant influence of industrial internships on self-leadership. This confirms that industrial internship experience contributes to the development of students' self-leadership skills. Finally, Hypothesis 4 confirms that the MBKM program indirectly enhances students' self-leadership through the implementation of one of its main components, namely, industrial internships. This finding indicates that industrial internships mediate the relationship between MBKM and self-leadership.

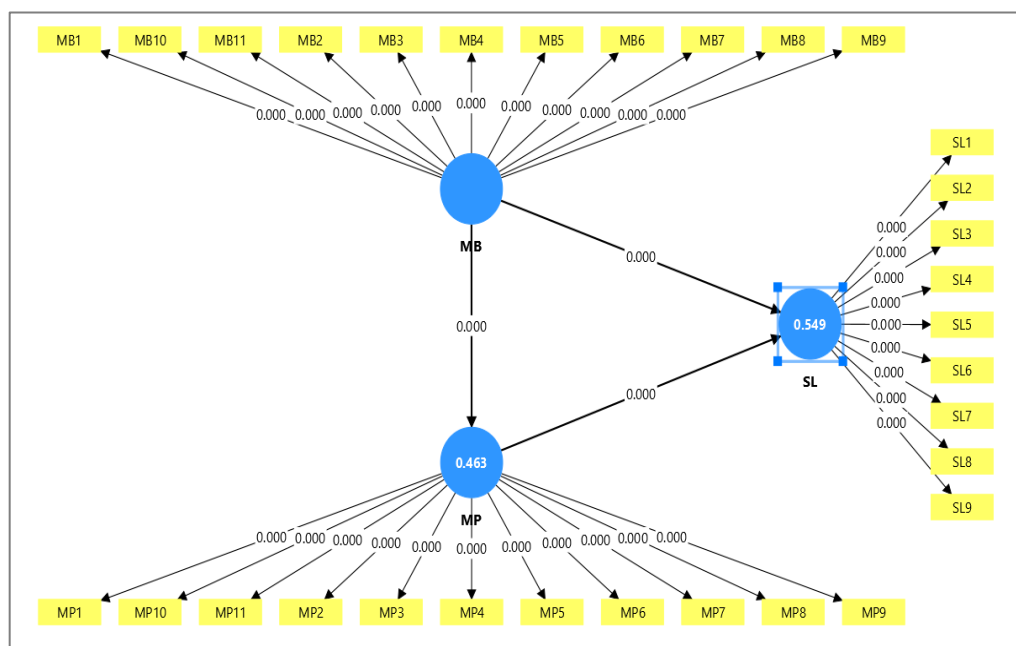


Figure 2. Research model after analysis

Figure 2 presents the bootstrapping results of the structural model. The findings indicate that all hypothesized relationships are statistically significant ($p < 0.001$). Specifically, MBKM significantly influences Industrial Internship and Self-Leadership, while Industrial Internship also has a significant positive effect on Self-Leadership. These results suggest that participation in the MBKM program not only directly enhances students' self-leadership but also indirectly supports its development through internship experiences. Furthermore, the model explains 46.3% of the variance in Internship ($R^2 = 0.463$) and 54.9% of the variance in Self-Leadership ($R^2 = 0.549$), indicating a moderate level of explanatory power.

DISCUSSION

Hypothesis 1: The Impact of the MBKM Program on Industrial Internships

The results of the first hypothesis test indicate that the MBKM program has a positive and significant effect on the implementation of industrial internship (t -statistic = 9.763; p -value = 0.000; β = 0.681). This finding confirms that the greater students' involvement in the MBKM program, the higher the quality of their industrial internship experience. MBKM serves as a foundation that prepares students cognitively, motivationally, and attitudinally before entering the industry: students receive guidance on learning objectives, competencies to be achieved, and the self-directed orientation they must possess (Salim et al., 2022). In accordance with previous findings that the MBKM program significantly enhances students' soft skills and technical skills in preparation for entering the world of work, which directly influences the quality of their contributions during their internships (Kuncoro et al., 2022).

This mechanism of influence operates through three complementary dimensions of MBKM: the technical dimension, which enables students to select relevant internship partners better and articulate the competencies they wish to develop; the learning process dimension, which instills an active learning mindset so that students proactively seek meaningful experiences during their internships; and the learning evaluation dimension, which encourages students to engage in self-reflection at their industrial internship. Syamsuadi et al. (2022) In their study on the implementation of MBKM, they found that students who received structured preparation prior to their internship demonstrated faster adaptation and made more meaningful contributions at their industrial internship compared to those who did not receive such preparation. Adrevi et al. (2025) Also confirmed a positive correlation between student participation in MBKM and improvements in adaptability and problem-solving skills required in the workplace. Thus, MBKM is not merely an administrative gateway to an internship, but a determinant of the quality of the internship experience that students will gain.

Hypothesis 2: The Influence of MBKM Programs on Students' Self-Leadership

Testing the second hypothesis revealed that the MBKM program has a positive and significant effect on students' self-leadership (t -statistic = 5.082; p -value = 0.000; β = 0.446). This finding confirms that MBKM directly develops students' ability to lead themselves, regardless of the internship program they undertake. This is understandable because the MBKM philosophy structurally positions students as active agents who must set learning goals independently, monitor progress, and evaluate achievements – all of which are direct manifestations of behavior-focused strategies in self-leadership such as self-goal setting, self-observation, and self-evaluation (Kim et al., 2024; Neck et al., 2023). Van Dorssen-Boog et al. (2020) empirically demonstrated that programs granting individuals autonomy to direct their own goals and activities significantly enhance self-leadership capacity, as such autonomy shifts motivation from being externally controlled to being autonomous and intrinsic.

From a mechanistic perspective, MBKM develops students' self-leadership through three interrelated pathways. Firstly, the fulfillment of the psychological need for autonomy, which is a prerequisite for natural reward strategies in self-leadership, whereby students find intrinsic motivation from the learning process itself when given the freedom to choose their learning pathway (Susilowati & Prameswara, 2025). Secondly, exposure to real-life situations that demand initiative and independent decision-making trains constructive thought strategies, namely the ability to manage one's thoughts constructively when facing challenges. Third, the reflective evaluation process within MBKM continuously reinforces behavior-focused strategies. Tenschert et al. (2025), in their systematic review, confirm that structured educational programs that consistently provide space for reflection and the setting of independent goals enhance participants' self-leadership capacity. Pursio et al. (2025) add that planned educational interventions are the primary pathway for developing self-leadership at the pre-employment stage, given that self-leadership is a skill that can be learned and strengthened through appropriate programs.

Hypothesis 3: The Influence of Industrial Internships on Student Self-Leadership

The results of the third hypothesis test confirm that industrial internships have a positive and significant effect on students' self-leadership (t-statistic = 3.777; p-value = 0.000; β = 0.361). Industrial internships influence self-leadership by placing students in real-world work environments that naturally demand initiative, independence, and self-management. Unlike strictly structured classroom learning, the internship environment forces students to make independent decisions, face uncertainty, and maintain performance amidst real-world job demands. These conditions directly train all three self-leadership strategies simultaneously (Harunavamwe et al., 2020). Naveed et al. (2026) demonstrated that exposure to job demands managed adaptively actually encourages individuals to develop stronger self-regulation strategies as a response mechanism to work-related pressure.

The mechanism by which internships foster self-leadership operates through three mutually reinforcing pathways. Firstly, the experiential learning mechanism: internships provide a cycle of real-world experience–reflection–conceptualization that strengthens self-directed learning far more effectively than theoretical learning; Kim et al. (2024) demonstrate how work-based learning programs empower individuals to take control of their own development through self-goal setting and constructive thinking. Second, the supervision and feedback mechanism: van Dorssen-Boog et al. (2020) demonstrate that a work environment offering both autonomy and clear guidance creates optimal conditions for the development of self-leadership, as autonomy transforms motivation into intrinsic drive whilst guidance ensures individuals remain productive. Thirdly, the mechanism of job demands: students who successfully respond to internship challenges adaptively will internalize this capacity as a sustainable self-leadership competence. Musa et al. (2025) confirmed that Work-Integrated Learning programs, which are conceptually equivalent to MBKM internships, significantly enhance students' work confidence and self-efficacy, both of which are prerequisites for effective self-leadership.

Hypothesis 4: The Mediating Role of Industrial Internship in the Relationship between MBKM and Self-Leadership

Testing of the fourth hypothesis demonstrated that industrial internship significantly mediates the relationship between the MBKM program and students' self-leadership (t-statistic = 3.260; p-value = 0.001; indirect β = 0.246). This finding of partial mediation reveals that MBKM develops self-leadership through two distinct mechanisms: a direct pathway via pedagogical processes that instill an independent and reflective orientation in students, and an indirect pathway that channels these effects into real-world work contexts through internship experiences. Van Dorssen-Boog et al. (2021), in their longitudinal intervention study, found a similar pattern: structured programs contribute directly to self-leadership, yet the effects become greater and more persistent when such autonomous practices are continued within a real-world work context that provides genuine feedback and consequences.

This partial mediation mechanism reflects two complementary pathways of self-leadership development. The direct pathway (MBKM > SL) operates on the cognitive and attitudinal dimensions: MBKM fosters internal predispositions for self-leadership in the form of reflective habits, self-directed orientation, and goal-setting capacity, which are shaped through pedagogical processes. The indirect pathway (MBKM > Industrial Internship > SL) operates on the experiential and behavioral dimensions: the quality of MBKM encourages students to undertake more meaningful internships, and these meaningful internships operationalize and reinforce these predispositions through real-world practice. Tenschert et al. (2025) confirm that a combination of structured programs and real-world practice yields greater development of self-leadership than either component alone. Musa et al. (2025) add that experience-based learning programs, when integrated with institutional policies, create stronger synergies for developing student competencies. The policy implication of these findings is that the enhancement of students' self-leadership must be undertaken simultaneously: strengthening the quality of MBKM implementation as a motivational foundation whilst ensuring the availability of high-quality industry placements as the practical arena.

CONCLUSION

These findings indicate that the *Merdeka Belajar Kampus Merdeka* (MBKM) program is effective in fostering students' independent leadership skills. In particular, experience-based learning through industry placements serves as a key mechanism for strengthening students' abilities in self-direction, self-management, and personal initiative. These results highlight the importance of integrating authentic work experience into the higher education curriculum.

Therefore, higher education institutions need to strengthen and expand the implementation of the MBKM program by increasing opportunities for experience-based learning, including industrial internships, innovation competitions, and project-based learning. These initiatives are expected not only to enhance students' self-directed leadership but also to develop broader employability skills, including problem-solving, adaptability, teamwork, and professional readiness, thereby improving graduates' competitiveness in the labor market.

Research Limitations

However, this study has several limitations. The sample was restricted to a single university, which may limit the generalisability of the findings. Furthermore, the sub-optimal Average Variance Extracted (AVE) value for the MBKM variable indicates the need for further testing, such as Confirmatory Factor Analysis (CFA), to strengthen construct validity. Moving forward, future research is advised to expand the sample size and integrate AI-based approaches into MBKM programs to support the development of students' competencies for the Industry 5.0 era.

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