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A Study of Curriculum Development Models in Vocational Health Higher Education to Support an Impactful Campus for Polytechnic Students

Purnomo Ananto[1]*, Benget Simamora[2], Marcel Haggai[3]
[1]Politeknik Negeri Media Kreatif, Jakarta, Indonesia, [23]Politeknik Kesehatan Genesis Medicare, Depok, Indonesia
Correspondence: purnomo.ananto@gmail.com[1]

Abstract

Curriculum development in vocational higher education continues to face structural challenges, particularly in aligning institutional design with dynamic labor market demands in the health sector. While existing studies emphasize competency-based and industry-oriented curricula, there remains a critical gap in empirically grounded, student-informed frameworks that integrate learning conditions, work–study balance, and adaptability to curricular change. This study addresses this gap by proposing a needs-informed curriculum development model derived from student experience, with an emphasis on adaptive learning environments and meaningful campus engagement. A quantitative descriptive approach was employed through a survey of 54 health polytechnic students. The study examined learning engagement, work–study conditions, and perceptions of curriculum implementation. The findings reveal that 72% of respondents were engaged in simultaneous work and study activities, while 68% reported achieving adequate mastery of theoretical knowledge and practical skills. However, 41% experienced moderate difficulties in adapting to curriculum changes, particularly in time management and instructional adjustment. These findings indicate that although dual-role students demonstrate resilience, structural support remains necessary to optimize learning outcomes. Based on these results, the study proposes a curriculum development model comprising three core components: (1) flexible curriculum structures accommodating working students, (2) adaptive learning strategies facilitating curriculum transition, and (3) experiential learning integration to enhance field relevance. The study implies that effective curriculum design in health polytechnics must extend beyond competency alignment to incorporate student adaptability and contextual learning dynamics. This research contributes a student-centered, empirically validated framework that strengthens institutional responsiveness and supports sustainable curriculum innovation.

KEYWORDS

curriculum, higher education, polytechnics, vocational.

Introduction

The relevance of education remains a central issue in vocational systems, particularly in ensuring alignment between curriculum design and labor market demands (Fu, 2023). Within this context, the curriculum functions as the core instrument that directs educational planning, resource allocation, learning processes, and assessment systems (Setiyawami et al., 2019; Setiyawan et al., 2020). However, vocational education is inherently vulnerable to rapid environmental changes, which in this study are defined as curriculum lag, skill mismatch, and declining graduate employability due to misalignment with technological, social, and policy developments (Auwalin & Rumayya, 2024; Chabiba.A.C & Hartini, 2023; Hartini et al., 2025; Zuo et al., 2025). This vulnerability is particularly evident in health polytechnic education, where evolving healthcare standards, digital health technologies, and service-oriented competencies require continuous curriculum adaptation.

In Indonesia, major educational policy shifts since 2020 particularly those related to pandemic-driven remote learning and the "Merdeka Belajar–Kampus Merdeka" (MBKM) framework have compelled higher education institutions to redesign curriculum structures, learning delivery, and assessment mechanisms. These reforms emphasize flexibility, experiential learning, and industry collaboration. Comparable practices have long been institutionalized in countries such as Germany and Switzerland through dual-system approaches that integrate workplace learning and competency-based assessment (Hippach-Schneider & Rieder, 2021). However, the transferability of such models to health polytechnics in Indonesia remains limited due to contextual differences, particularly in non-manufacturing, service-oriented education.

In practice, polytechnic curricula generally adopt a composition of approximately 60%–70% practical learning and 30%–40% theoretical instruction, implemented through institutional standards and often combined with internships or clinical placements (Mulyono et al., 2024). While this structure aims to strengthen applied competencies, it also generates challenges for students who simultaneously engage in work, particularly in terms of time management, learning adaptability, and mastery of competencies. Moreover, existing curricula are often criticized for providing limited space for creativity, reflective learning, and meaningful experiential engagement (Yusop et al., 2022). This indicates a specific problem in the health polytechnic context: curriculum structures are not yet sufficiently responsive to student conditions and adaptive learning needs.

Although prior studies have emphasized industry relevance, link-and-match principles, and the integration of Industry 4.0 competencies (Verawadina et al., 2019), there remains a lack of empirically grounded models that incorporate student perspectives as a basis for curriculum design, particularly in non-manufacturing fields such as health education. This study addresses this gap by proposing a student-informed curriculum development model grounded in empirical evidence on learning engagement, work–study balance, and adaptability to curriculum change.

Furthermore, the concept of an "impactful campus" in this study is operationalized as a learning environment that enhances three measurable outcomes: (1) student competency mastery (theoretical and practical), (2) adaptability to curriculum and learning changes, and (3) meaningful engagement in experiential and work-integrated learning. Accordingly, this study advances a novel contribution by integrating student-based empirical insights into curriculum model development, which has been underexplored in previous research.

Based on this rationale, the study is guided by the following objectives: (1) to identify student learning conditions and challenges within health polytechnics, (2) to analyze the relationship between work–study conditions and learning outcomes, and (3) to develop a needs-informed curriculum development model that supports adaptability and impactful learning experiences. Through this approach, the study seeks to strengthen the theoretical and practical foundations of curriculum development in vocational health education.

Methods

This study adopts a quantitative descriptive design complemented by document analysis and a structured literature review to develop a needs-informed curriculum model for health polytechnics. Conceptually, the study is positioned as a needs assessment–driven model development, in which empirical student data serve as the primary basis for formulating curriculum design components.

The survey involved 54 respondents selected using a purposive sampling strategy, with eligibility criteria including active enrollment in a health polytechnic program and experience in following the current curriculum for at least one academic semester. Respondents were recruited through institutional academic networks. The demographic profile included variation in gender, study programs, and working status, with a significant proportion identified as working students with varying weekly working hours. Data were collected using a structured questionnaire administered via Google Forms. The instrument consisted of six core items covering: (1) work–study status, (2) perceived academic workload, (3) sources of learning difficulty, (4) perceived mastery of theoretical and practical competencies, (5) adaptability to curriculum changes, and (6) perceived impact of study on work and society. Responses were measured using a combination of dichotomous (yes/no) and ordinal Likert-type scales. Prior to deployment, the instrument underwent expert review for content validity and a limited pilot test to ensure clarity and relevance; internal consistency for scaled items indicated acceptable reliability (Cronbach's alpha > 0.70).

In addition to the survey, document analysis was conducted on institutional curriculum guidelines, national higher education policies (including MBKM framework), and relevant curriculum design standards. Documents were selected based on relevance to vocational and health education curriculum structures and analyzed using thematic coding to identify key design principles. The literature review focused on prior studies addressing competency-based curricula, industry alignment, and vocational education adaptability.

Data analysis employed descriptive statistics (percentages and frequency distributions) to interpret student responses, supplemented by comparative interpretation between working and non-working students. The development of the curriculum model followed three stages: (1) identification of student needs and constraints, (2) synthesis with theoretical and policy frameworks, and (3) formulation of model components and design principles. Ethical considerations were addressed through informed consent, voluntary participation, and anonymity of respondents.

Result and Discussion

Sample Characteristics

The study involved 54 students from a health polytechnic, consisting of Diploma Three Pharmacy (5th semester) and Applied Bachelor of Medical Laboratory Technology (5th and 7th semesters). The sample reflects variation in academic level and study program, with a distribution of 40.7% working students and 59.3% full-time students. This composition is analytically relevant for examining differences in learning conditions, particularly in relation to work–study balance and curriculum adaptability.

Work–Study Status and Academic Workload

The findings indicate that a substantial proportion of students (40.7%) combine study and employment, confirming a dual-role learning context. Regarding perceived workload, 70.4% of respondents reported a neutral level of academic demand, 18.5% perceived it as demanding, and 11.1% as not

Figure 1. Survey Results of Questions 1–3

constraints (48.1%), financial pressures (37.0%), course demanding. The main challenges reported include time difficulty (9.3%), and instructional limitations (5.6%). These results highlight time management as the dominant constraint rather than academic complexity alone.

Mastery, Adaptability, and Perceived Impact

In terms of competency mastery, 75.9% of students reported sufficient mastery of theoretical and practical components, while 22.2% indicated limited mastery. Cross-tabulation analysis shows that working students tend to report slightly lower mastery levels compared to full-time students, although the difference remains moderate.

Adaptability to curriculum changes defined in this study as adjustments to course structure, schedules, assessment methods, internship schemes, and MBKM-related activities was reported as high, with 85.2% of students indicating successful adaptation. However, 14.8% experienced difficulties, particularly among those balancing work commitments. Regarding perceived impact, 72.2% of students reported positive contributions of their studies to their work and social environment, while 25.9% perceived the impact as not yet significant. This suggests that vocational learning is generally transferable to professional contexts, although its intensity varies across individuals.

The development of vocational education curriculum models constitutes a strategic effort to achieve the objectives of an "impactful campus," which in this study is operationally defined through three measurable dimensions: (1) the level of student competency mastery, encompassing both theoretical understanding and practical skills; (2) the degree of student adaptability to curriculum dynamics, including changes in course structure, assessment systems, and experiential learning components; and (3) the extent to which learning outcomes demonstrate relevance and transferability to professional practice and societal contribution. Within this framework, an impactful campus is not merely characterized by curriculum–industry alignment, but by its capacity to generate adaptive, competent graduates whose learning experiences translate into tangible outcomes in workplace performance and social value creation.

Preparing vocational education graduates who possess skills aligned with the needs of industry and the labor market is a primary goal of vocational curriculum development (Affandi et al., 2025). Based on an analysis of vocational education curricula across the ASEAN Economic Community, it has been found that vocational school curricula within the region tend to prioritize standardized competencies and soft skills (Fitriyanti et al., 2021). A survey involving 54 students from a health polytechnic comprising Diploma Three Pharmacy (5th semester) and Applied Bachelor of Medical Laboratory Technology (5th and 7th semesters) identified several key empirical patterns related to student learning conditions. Specifically, the findings capture five main trends: (1) work–study status, indicating that a considerable proportion of students simultaneously engage in employment; (2) perceptions of academic workload, which are predominantly assessed as moderate rather than excessively demanding; (3) levels of mastery of theoretical and practical competencies; (4) adaptability to curriculum changes, including adjustments to course structures, assessment systems, and experiential learning components; and (5) perceived impact of education on students' professional roles and broader social contributions. These dimensions provide a structured basis for interpreting how existing curriculum implementation interacts with student realities in vocational health education.

From a methodological standpoint, the institutional context of the study reflects a specific segment of health polytechnic education, particularly students in mid-to-advanced semesters who have experienced substantial exposure to both academic and practical learning components. The use of purposive sampling ensures relevance to the research objective namely, capturing informed student perspectives on curriculum implementation although it also implies limited generalizability beyond similar institutional settings. Therefore, the findings should be interpreted as context-specific empirical insights that inform curriculum model development, rather than as broadly representative conclusions of all vocational education contexts.

The survey results in Figure 1 show that 40.7% of students are working while attending college, while 59.3% are full-time students. These findings show that a substantial proportion of respondents pursue vocational higher education while simultaneously engaging in employment. Studying while working has become a common trend over the past few decades (Chantrea et al., 2021). These students have already been exposed to the workplace and are aware of the competencies required to perform their jobs effectively. Enrolling in vocational higher education is therefore perceived as an effort to enhance their skills and to meet the demands of their professional roles (Mesra et al., 2021; Suryadharma et al., 2023).

Regarding students' perceptions of academic workload, 70.4% reported feeling neutral, 18.5% perceived their studies as demanding, and 11.1% did not find them demanding at all. These results indicate that working students undertake dual roles that introduce multiple academic and non-academic challenges, particularly in relation to time allocation, workload management, and role conflict. However, rather than attributing this condition directly to psychological resilience an empirically measurable construct requiring validated instruments this study interprets the finding as reflecting students' capacity to manage competing demands within constrained conditions. This interpretation is based on

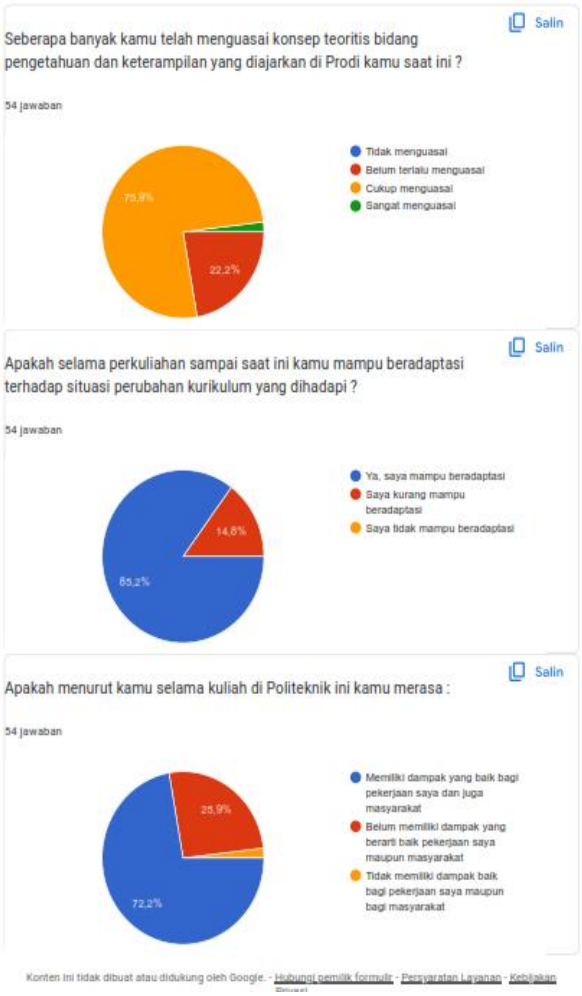

Figure 2. Survey Results of Questions 4–6

observed patterns of workload perception and continued engagement in academic activities, rather than on a direct measurement of resilience. Consequently, the findings suggest the need for institutional support mechanisms, such as flexible scheduling and adaptive learning strategies, to better accommodate students facing dual-role pressures. Nevertheless, perceiving the workload as demanding does not necessarily constitute a major barrier to continuing vocational education (Afif et al., 2022; Toripa & Huwae, 2023).

The reasons students reported for perceiving their studies as demanding included time constraints or class schedules (48.1%), tuition-related financial issues (37.0%), difficult courses (9.3%), and lecturers' perceived limited instructional effectiveness (5.6%). These findings indicate that time management is one of the primary challenges faced by students who study while working (Bangquiao et al., 2023; Rafi'y et al., 2022). Effective and efficient time management can serve as a key determinant of academic success, particularly for polytechnic students who devote a significant portion of their time to employment. This aligns with previous studies identifying efficient time management as a critical success factor for working students (Hasnun & Mustaffa, 2020; Muhmin, 2018).

Further findings derived from survey Questions 4–6 are presented in Figure 2.

With regard to mastery of theoretical concepts and skills taught within their study programs, 75.9% of students reported sufficient mastery, 22.2% indicated limited mastery, and 1.9% reported very high mastery. These results suggest that students demonstrate a relatively high level of theoretical understanding while also acquiring the necessary practical skills. This implies that vocational higher education learning approaches that integrate theory and practice are well received, even among students who are concurrently employed (Bobe & Karber, 2022).

The findings related to students' ability to adapt to curriculum changes revealed that 85.2% were able to adapt effectively, while 14.8% reported difficulties in adaptation. This indicates that polytechnic students possess a high level of adaptability, which may stem from their experience in balancing educational and professional responsibilities. Consequently, when confronted with changes in vocational education curricula, they tend to have a strong adaptive foundation (Kim et al., 2020). This is consistent with the broader objective of vocational education, which extends beyond theoretical mastery to the development of applied competencies in real-world work contexts (Musa & Rashid, 2020). Furthermore, polytechnic students are expected to demonstrate flexibility and adaptability in response to evolving job demands and workplace changes (Buehler et al., 2024).

Finally, the results indicate that 72.2% of students perceived their studies at the polytechnic as having a positive impact on their work and on society, 25.9% reported that the impact was not yet significant, and 1.9% perceived no positive impact on either their work or society. These findings indicate that students perceive their learning experiences as relevant and applicable to their professional roles (Deepthi & Exley, 2023; Hamalik, 2020). However, this conclusion is based primarily on self-reported perceptions rather than in-depth qualitative evidence. Descriptively, several respondents indicated that specific components of the curriculum such as practical laboratory sessions, clinical exposure, and internship activities support their ability to perform work-related tasks more effectively, particularly in applying technical procedures and adhering to professional standards. For example, students reported improved confidence in executing laboratory techniques and better understanding of workplace protocols following hands-on learning experiences.

Nevertheless, the absence of systematic qualitative data, such as structured interviews or documented case narratives, limits the depth of interpretation regarding how curriculum elements translate into concrete workplace contributions. Therefore, while the findings suggest a positive linkage between vocational education and professional impact, this relationship should be interpreted cautiously. Future research is recommended to incorporate qualitative approaches to capture richer experiential evidence and to more rigorously substantiate the mechanisms through which curriculum design influences workplace performance and societal contribution. Such experiences may enhance their opportunities for career advancement and enable them to make more substantial contributions to their socioeconomic environments and communities (Alfianti et al., 2024; Oswald-Egg & Renold, 2021).

Conclusion

The findings indicate that a substantial proportion of polytechnic students engage in dual roles as learners and workers, with most perceiving their academic workload as manageable despite notable constraints related to time management and scheduling. Descriptively, the majority of students report adequate mastery of theoretical and practical competencies, a relatively high capacity to adapt to curriculum changes, and positive perceived impacts of their studies on professional practice and social contribution. However, these conclusions are based on self-reported perceptions and should not be interpreted as evidence of causal influence or statistical significance. In terms of contribution, this study advances a needs-informed approach to curriculum development by

translating empirical student experiences into actionable design principles. Specifically, the proposed model emphasizes: (1) flexible curriculum structures (e.g., modular scheduling and hybrid delivery) to accommodate working students; (2) adaptive learning mechanisms to support transitions in curriculum components such as course design, assessment, and experiential learning; and (3) strengthened integration of practice-based learning, including internships and laboratory activities, to enhance competency relevance and transferability. These components provide a practical framework for polytechnic leaders and lecturers to redesign curricula that are responsive to student conditions while maintaining alignment with professional standards.

Practically, institutions are encouraged to implement targeted interventions, such as flexible timetabling policies, structured academic support for students experiencing adaptation difficulties, and systematic alignment between theoretical instruction and workplace-based learning. Additionally, greater recognition of prior learning and work experience may further optimize student engagement and competency development. Future research should address current limitations by employing larger, multi-institutional samples and mixed-method designs that integrate quantitative and qualitative data. Longitudinal approaches, objective competency assessments, and subgroup analyses (e.g., working versus non-working students) are recommended to more rigorously evaluate curriculum effectiveness. Furthermore, subsequent studies should pilot and validate the proposed curriculum model to examine its impact on learning outcomes and workplace performance in a more robust and generalizable manner.

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