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Enhancing vocational education through continuous professional development: Analysing the non-degree program for Indonesian polytechnic lecturers

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ABSTRACT

Continuous professional development for lecturers, bolstered by government initiatives, is crucial for their ability to meet the changing requirements of the labour market. This research explored the effects and long-term viability of the Non-Degree Program for Polytechnic Lecturers (NDPKD) in Indonesia. The study employed both open- and closed-ended questionnaires to examine the program's impact on improving vocational education. A total of 512 lecturers from both state and private polytechnics took part in the study. The results indicated that the NDPKD program had a beneficial impact on lecturers' competencies and fostered greater collaboration with industry partners. Participants reported that their skills and knowledge had improved, resulting in more effective teaching practices and greater engagement with industry. Nonetheless, several challenges arose, including time constraints, variation in initial skill levels, and insufficient institutional support. The constraints of time posed challenges for lecturers in fulfilling program requirements alongside their current responsibilities. Additionally, the diverse levels of competency highlighted the necessity for more customised training approaches. The lack of substantial institutional support significantly diminished the program's overall effectiveness. The study suggests implementing more adaptable scheduling options, creating tailored training programs, and enhancing the support systems within institutions. By focusing on these elements, we can improve the continuity and sustainability of the NDPKD program, thereby maximising its impact on vocational education in Indonesia.

INTRODUCTION

Vocational education plays a critical role in preparing a skilled workforce that aligns with industrial demands (Nurhadi & Lyau, 2018). It provides students with specialised knowledge and practical skills required for employment in various industries. Unlike general education, vocational education emphasises hands-on experience, ensuring that graduates are job-ready upon completion of their studies (Rongmin & Fah, 2024). However, Billett (2011) notes that a significant challenge in vocational education is ensuring that educators remain up to date with the latest industry trends, teaching methodologies, and technological advancements.

The global workforce is undergoing a transformation driven by rapid technological advancements, shifts in economic structures, and evolving industry demands. The Industrial Revolution 4.0 has further intensified the need for skilled professionals capable of navigating digital work environments. Traditional teaching methods, which primarily focus on rote learning and

theoretical knowledge, are no longer sufficient to prepare students for modern workplaces (Mhlanga, 2022). Instead, vocational education must integrate new teaching strategies that incorporate digital tools, automation, and problem-solving approaches relevant to real-world scenarios. As a result, vocational educators must undergo continuous professional development to ensure they can effectively impart knowledge and skills that align with contemporary industry requirements (Smeplass, 2023).

In Indonesia, vocational education is a crucial component of the nation's economic growth strategy. The government has implemented several initiatives to improve the quality of vocational training, with a strong emphasis on aligning educational programs with industry needs (Pradipta et al., 2021). The introduction of the Merdeka Belajar-Kampus Merdeka (MBKM) policy, for example, aims to create a more flexible and industry-oriented educational system. One of the key programs under this initiative is the Non-Degree Program for Polytechnic Lecturers (NDPKD), designed to enhance the teaching capabilities of vocational educators. By participating in this program, lecturers can gain practical industry experience, develop innovative teaching methods, and establish networks with industry professionals.

The significance of the NDPKD program lies in its potential to bridge the gap between academic instruction and industry expectations. Many vocational educators possess strong theoretical knowledge but lack direct industry exposure (Yoto et al, 2024). This disparity often results in a mismatch between what is taught in classrooms and the actual skills required in the workplace. By engaging in industry-based training and professional development, lecturers can gain firsthand insights into industry practices, which they can then translate into more effective classroom instruction.

A well-trained vocational education workforce is vital for economic development. According to data collected by Hanushek et al (2017), countries with robust vocational education systems experience lower unemployment rates and higher productivity levels. This is because vocational training equips students with practical skills that are directly applicable to the job market. However, the success of these programs depends heavily on the competence of the educators delivering them. When lecturers receive appropriate training and engage in continuous professional development, they can better prepare students for employment, thereby contributing to a more competitive and skilled workforce.

Despite its numerous benefits, vocational education in Indonesia faces several challenges. One major issue is the limited collaboration between educational institutions and industries. Many vocational programs lack strong partnerships with businesses, resulting in outdated curricula that do not reflect current industry needs (Misbah et al, 2020). Furthermore, vocational lecturers often struggle with limited access to professional development opportunities. Unlike their counterparts in general education, vocational educators require specialised training that integrates technical expertise with modern pedagogical techniques (Faqihuddin et al, 2024). Without ongoing professional development, educators may struggle to keep pace with industry advancements, resulting in a decline in the quality of vocational education.

The NDPKD program aims to address these challenges by providing vocational educators with structured training and industry exposure. Through workshops, industry placements, and collaborative projects, lecturers participating in NDPKD can refine their teaching strategies and incorporate industry's best practices into their curricula. Moreover, the program fosters collaboration between educational institutions and businesses, ensuring that vocational training remains relevant to labour market demands.

A crucial aspect of the NDPKD program is its emphasis on integrating technology into vocational education. As industries adopt digital technologies, educators must also adapt their teaching methodologies to include digital tools, artificial intelligence, and automation. Training programs under NDPKD focus on equipping lecturers with digital literacy skills, enabling them to effectively incorporate technology into their teaching practices. This is particularly important in fields such as engineering, manufacturing, and information technology, where digital competencies are essential for workforce readiness.

Several studies highlight the importance of continuous professional development for vocational educators (Collin et al, 2012; Tyler & Dymock, 2017; van der Klink & Streumer, 2017).

According to Garrison and Anderson (2003), lecturers who undergo regular training and development are more effective in engaging students and improving learning outcomes. Similarly, research by Yusof et al. (2023) emphasises the need for up-to-date training in technical education, ensuring that lecturers possess the necessary skills to deliver high-quality instruction. The literature also suggests that professional development programs should be tailored to the specific needs of vocational educators, incorporating both pedagogical training and industry-specific knowledge.

Another critical factor in the success of vocational training programs is institutional support. Educational institutions must recognise the value of ongoing training for lecturers and provide adequate resources for professional development. This includes funding for training programs, access to modern teaching facilities, and opportunities for lecturers to engage with industry experts. Without institutional support, the effectiveness of initiatives such as NDPKD may be limited, thereby reducing their impact on the quality of vocational education.

Given the evolving landscape of vocational education, it is imperative to establish a sustainable model for professional development. The future of vocational training depends on educators' ability to adapt to evolving industry demands and technological advancements. Programs like NDPKD must be continuously evaluated and refined to ensure they remain relevant and practical. Policymakers, educators, and industry stakeholders must work collaboratively to strengthen vocational education systems and create pathways for continuous learning and skill development.

This paper provides a comprehensive analysis of the NDPKD program, examining its impact, challenges, and future directions. By integrating survey data, implementation reports, and literature reviews, this study seeks to contribute to the ongoing discourse on vocational education improvement in Indonesia. The findings offer valuable insights into how professional development programs can be optimised to enhance the quality of vocational education and better prepare students for the workforce. Three research questions addressed in this study are: (1) What impact does the NDPKD program have on lecturers, students, and institutions?; (2) What are the key challenges faced by lecturers participating in the NDPKD program?; (3) In what ways does the NDPKD program facilitate collaboration between educational institutions and industries?; and (4) What modifications can be made to improve the program's design to support lecturers' professional development better?.

METHOD

Research Design

This study employs a mixed methods approach, combining quantitative and qualitative methods. Almeida (2015) states that mixed methodologies are employed when both comparative analysis and the development aspects of the study need to be undertaken comprehensively and in depth. The study aims to obtain comprehensive data on the perceptions and challenges associated with the NDPKD program among vocational education lecturers in Indonesia. The research was conducted across various polytechnics in Indonesia, focusing on lecturers who had participated in the NDPKD program.

Participants and Instrument

The study population comprised polytechnic lecturers who had participated in the NDPKD program. The sample was selected through purposive sampling to ensure representation across various disciplines and institutions. The online questionnaire, developed in Google Forms, was distributed to participants, and responses were collected over four weeks. The research design employed a descriptive survey, which involved collecting data via an online questionnaire completed by 512 lecturers from various disciplines within vocational education institutions. The questionnaire was designed to assess lecturers' perceptions of competency improvement, teaching methodologies, and the challenges they face in implementing new skills acquired through the NDPKD program. Quantitative data were collected using a Likert-scale questionnaire to measure lecturers' perceptions of the program's effectiveness in improving their competencies and teaching practices. Qualitative data were obtained through open-ended questions, which allowed participants to elaborate on their

experiences, challenges, and the perceived impact of the NDPKD program on their teaching practices.

Data Analysis

Quantitative data were analysed using descriptive statistics (mean, median, mode, and standard deviation) to identify patterns and trends in lecturers' perceptions. For qualitative data, thematic content analysis was employed to identify key themes in participants' responses and relate them to the research objectives (Anderson, 2007). This study aims to evaluate the extent to which the NDPKD program has influenced lecturers' teaching practices and to identify the challenges they face in implementing new skills. The findings, with their practical implications, are expected to significantly contribute to improving non-degree professional development programs in vocational education by aligning them with educators' needs and industry demands.

RESULTS AND DISCUSSION

Results

This section presents the results of the survey data analysis completed by lecturers participating in the NDPKD Program. The data was processed to explore the program's effectiveness in enhancing lecturer competencies, identify challenges faced, and formulate suggestions for future improvements. The results are presented in seven main subsections: program awareness and policy alignment; impact on lecturer competencies; impact on student development; impact on institutions and professionals; program design and structure; program sustainability; and general participant perceptions of program effectiveness, challenges experienced, and suggestions for program development.

Impact on Lecturer Competencies

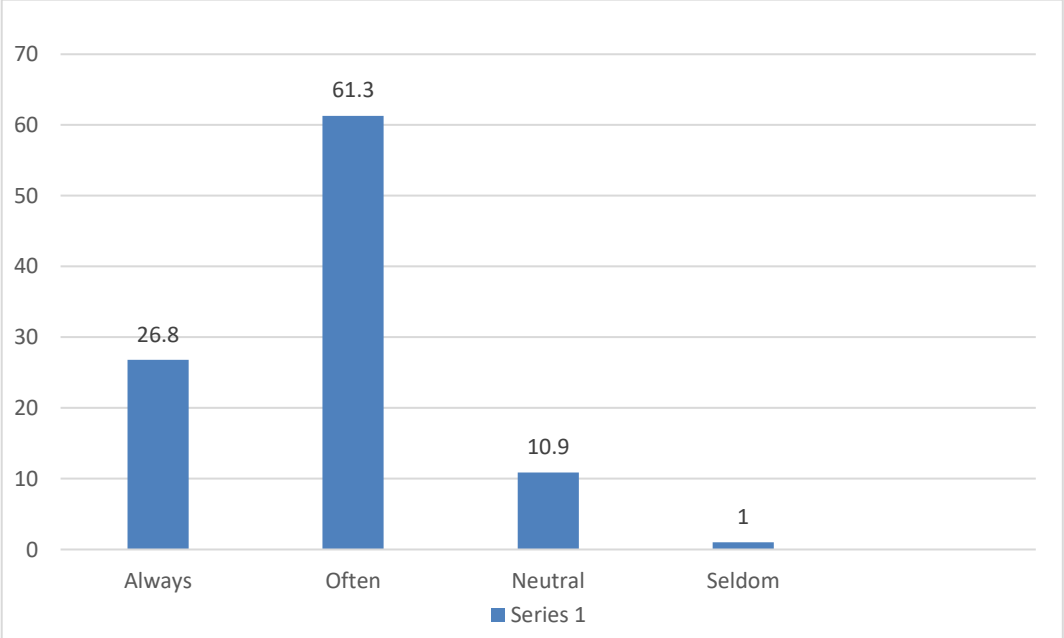

Figure 1. Participants' responses on how frequently they apply the competencies they gained from the NDPKD Program

A total of 463 participants reported adopting new teaching methods. Examples of new teaching methods adopted after participating in the NDPKD program include project-based learning (PBL), artificial intelligence, and problem-based learning. One participant described implementing PBL as follows: "I applied PBL from the Applied Approach and industrial internship practices in

teaching and practical sessions, and I implemented it in the program policy as I am currently the program coordinator." Another vocational lecturer stated, "Project-based learning involving welding work, in line with the program I took. Its implementation aligns with the competency standards of a welding practitioner in executing and supervising projects."

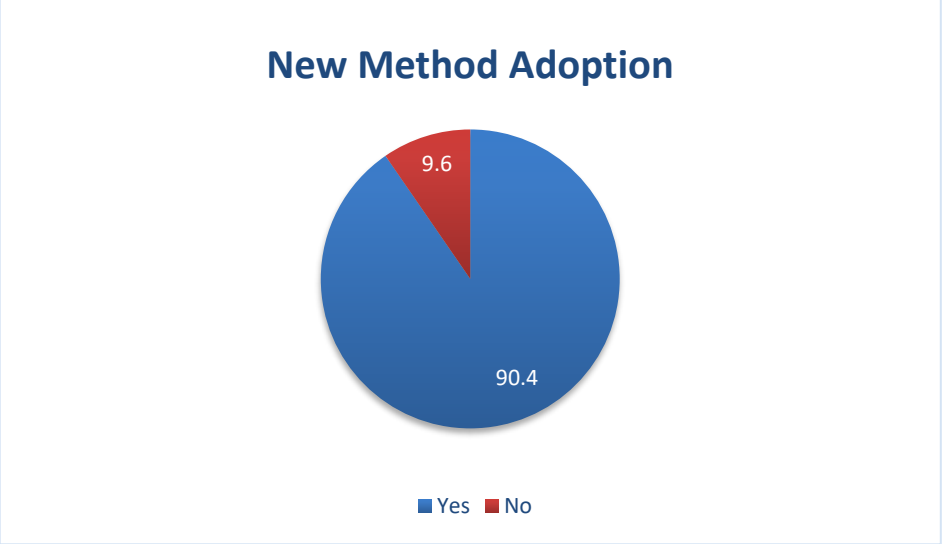

Figure 2. Participants' responses to whether they adopted a new teaching method after the program or not

The training received by lecturers or practitioners has a direct positive impact on students when these materials are applied in the learning context. The main implication of the given examples is the improvement of students' competencies and practical skills relevant to industry needs. For instance, digital marketing materials taught by lecturers can help students master the digital tools required for projects in the digital era. One participant stated, "I teach digital marketing materials to students by introducing various tools that can be used in learning and project work."

Students' experiences conducting solar panel installation and operation training in the community demonstrate their ability to apply relevant theories, such as control systems and power generation, to practical, beneficial applications for the community. One participant expressed this: "Students can provide training, installation, and operation of off-grid solar panels in the community, where students are given projects during practical sessions relevant to courses such as power generation, control systems."

Students who can complete tasks similar to certification exams also gain valuable preparation for future certification exams, enhancing their competitiveness in the job market. Creating Non-Destructive Testing (NDT) specimens under the guidance of industry practitioners helps students understand the design, fabrication, and inspection processes in accordance with industry standards, providing them with in-depth vocational practice experience. One participant revealed, "Creating non-destructive test (NDT) specimens. Students are given the problem that the lab needs new specimens for inspection/NDT, both plates and pipes. Students work in teams to design products in accordance with specifications, then prepare and fabricate specimens under the guidance of relevant course lecturers. In this stage, as a welding practitioner, I provide guidance and supervision of the work, as is common in industry. After the product is completed, I conduct a visual inspection. All my work is also demonstrated to students so they can also become practitioners in the industry."

Impact on Institutions and Professionals

Examples of collaborations, whether implemented or planned, demonstrate active efforts by participants to integrate training with productive cooperation across various sectors. Some participants described their collaborations, such as "Developing a halal-based LMS with an NGO. Our collaboration with the council, we are creating a new master's program that will require

international training and certification", indicating multidisciplinary collaboration focused on enhancing educational standards with a global orientation. Another example is collaboration with local governments, as stated by one participant, "Collaboration with the Lhokseumawe city government in creating a digital waste retribution application." This demonstrates efforts to improve public services directly through technology.

Additionally, collaboration with industry and SMEs is also a significant focus. One participant revealed, "Developing products for industry needs and localising imported parts is the main feeder for real student learning materials for the industry. From concept, analysis & simulation, part machining, standard parts, projects (jigs, SPM, etc.), because of the job market, I can maximise the variety of products that can be explored and realised." This collaboration not only produces real products for industry but also provides practical, applicable learning opportunities for students. Furthermore, efforts to support small and medium enterprises (SMEs) are evident through collaborations, as another participant stated: "I help entrepreneurs and SMEs to obtain halal certificates." This collaboration enhances SMEs' competitiveness and helps students understand the halal certification process, which is increasingly relevant in domestic and international markets. Through these collaborations, participants can make tangible contributions aligned with the needs of industry, society, and education, thereby creating synergy among academia, government, industry, and SMEs.

As a follow-up to the NDPKD program, one participant stated, "Writing an HRM book with various authors from various polytechnics participating in the NDPKD HCGM Scheme." The authors of this book are affiliated with various polytechnics, indicating cross-institutional collaboration. This can enrich the book's content by incorporating diverse perspectives from each polytechnic. As part of the HCGM (Human Capital and General Management) scheme under the NDPKD (National Development Program for Knowledge Dissemination), this book likely adheres to national standards in human resource management (HRM). This suggests that the book's content is expected to be relevant and applicable nationally. From this, it can be concluded that the NDPKD program also provides participants with greater opportunities for networking and collaboration.

Challenges

Participants encountered various challenges in applying the skills and knowledge acquired through the NDPKD program, particularly with respect to funding and the availability of facilities and infrastructure. Several participants highlighted budget-related constraints. One participant shared their experience: "Costs, in my field of Cloud, require budget allocation from the university to apply it," indicating that applying advanced technologies like Cloud Computing necessitates financial support from institutions. Another participant added that funding is a significant challenge, especially for equipment procurement, stating, "The challenge is I need funding for equipment procurement because I use personal and research funds to rent equipment suitable for learning (TKDN 0, must import if purchased with state funds)." This illustrates the limitations of budget allocation, particularly for low domestic component goods that must be imported.

In addition to budget constraints, the availability of adequate facilities and infrastructure was also identified as a barrier. Some participants revealed that their institution's laboratories lacked the equipment available in certification laboratories. One participant stated, "The availability of facilities and infrastructure supporting the application of skills and knowledge. Our laboratory facilities are not as complete as those in certification laboratories," indicating that disparities in facilities can hinder the application of new skills.

In addition to financial and facility constraints, collaboration within the work environment posed challenges to the application of new skills. One participant mentioned, "Some new skills, such as using technology in teaching or project-based teaching methods, require cross-departmental or industry collaboration. If the work environment does not encourage collaboration, implementing these skills will be more difficult." This suggests that, without a supportive, collaborative work culture, new skills in educational technology or project-based learning approaches may not be fully implemented.

Program Design and Sustainability

Regarding the design and structure of the NDPKD program, several participants provided suggestions. For example, "It is hoped that this program will add activities focused on project-based teaching. Collaboration among participants who have completed activities such as writing books as part of their training should be encouraged. It is preferable to provide opportunities for lecturers who have not previously received funding. The two-year period is too short to receive funding again, so it is hoped that each year, different people will receive funding."

Another participant stated, "Integrated certification with lecturer internship programs. After completing their training and certification, lecturers have the opportunity to apply their knowledge and skills in the industry through internship programs. The goal is to confirm the updating of knowledge, methodology, and technology as applied in the industry." These suggestions indicate a desire for the NDPKD program to support not only theoretical skill development but also practical application and skill renewal through direct industry experience and participant collaboration.

A total of 506 participants (98.8%) preferred that the NDPKD program continue under the existing scheme, whereas 6 participants (1.2%) did not. Most participants reported that the NDPKD program had a positive impact on enhancing lecturers' competencies. One participant explained clearly, "Of course, I strongly agree that this program should continue. Not all universities or lecturers have sufficient funding to participate in high-level certification or internships. Without this program, lecturers would struggle to participate in certifications that require high costs. Especially those of us outside Java. The costs become higher because we have to bear transportation and accommodation expenses as well."

"The world and technology are developing very quickly, while campus support facilities are sometimes very minimal because the equipment is outdated, so the experience of participating in training with this activity is essential to broaden knowledge and experience as well as lecturer competencies."

Some participants even suggested that the NDPKD program be held several times a year. Some participants also wanted the training duration to be extended to allow for better integration of theory and practice. For example, "For Open RAN Certification, there is not enough time for participants to practice because the time is spent maximising theory. Whereas theory and practice both have important portions for participants to solidify and sharpen their competencies, especially in the field of Open RAN."

Discussion

Vocational education in developing countries continues to face persistent challenges in aligning its outcomes with the evolving demands of the labour market. Despite its crucial role in preparing a skilled workforce, many vocational institutions still struggle to ensure that their programs meet industry expectations. Existing studies have shown that these challenges often stem from inadequate teacher competencies and limited curriculum responsiveness to labour market changes. For instance, Nurhadi and Lyau (2018) conducted a literature review that highlighted the challenges facing vocational education in developing countries. They emphasised the mismatch between educational outcomes and industry needs, pointing out that the effectiveness of vocational training is hindered by inadequate teacher competencies and the failure to align curricula with evolving labour market demands. This framework underscores the importance for vocational educators of adapting to local and global trends, thereby enhancing the relevance and quality of vocational education and addressing systemic issues that impede its success in these regions.

Vocational education plays a crucial role in preparing individuals for the workforce, though it often struggles to ensure the relevance and practicality of its curriculum. It combines theoretical knowledge with practical application, with a strong emphasis on job readiness (Yoto, 2018). Experts suggest that one key strategy to improve the effectiveness of vocational education is to provide opportunities for hands-on learning in real work environments, ensuring that the infrastructure and learning environment closely mimic actual workplace conditions. Additionally, involving instructors with industry-relevant skills supported by an efficient education system is essential (Nurhadi & Lyau, 2018).

The curriculum in vocational education should ideally be centred on an apprenticeship-like system, in which students can directly develop skills aligned with their chosen fields or occupations (Yoto, 2018). This approach equips learners with the necessary skills and expertise for the job market while bridging the gap between educational institutions and the real world. To create such conditions, vocational educators are increasingly expected to collaborate closely with industries and workplaces, acting as liaisons and trainers to facilitate meaningful learning experiences for students (Isopahkala-Bouret, 2010).

Vocational educators must be prepared to face changes resulting from current educational reforms aimed at bridging the gap between education and employment. Building strong partnerships between educational institutions and workplaces is crucial to enhancing the relevance of vocational education. The NDPKD survey results indicate that these training programs positively impact educators, helping them reach this stage, albeit imperfectly. A key factor contributing to this positive impact is the NDPKD's role in facilitating regular dialogue among vocational educators, industry instructors, and students on tasks and learning content, as well as in joint planning and follow-up on student placements in companies. This collaboration enables the exchange of experiences and competencies between educators and industry professionals, thereby aligning learning content and environments more closely with labour market needs. Collaboration between educators and industry can be enhanced through programs that enable industry to familiarise itself with polytechnic programs. Meanwhile, educators can gain up-to-date industry knowledge and skills and expand their professional networks to support their students (Hiim, 2022; Isopahkala-Bouret, 2010).

In the era of Industry 4.0, the competencies required of vocational educators have become more multidimensional and dynamic. They must adapt to rapid technological advancements and ensure their teaching remains relevant and responsive to industry needs. Vocational educators are expected to have a deeper understanding of pedagogical theory and educational practice, as well as the ability to integrate new technologies and industry-specific skills into their teaching. To address these challenges, governments can assist vocational education institutions in prioritising the professional development of teaching staff by providing opportunities for industry-based training and continuous learning. This can foster collaboration between schools and workplaces, enabling educators to exchange experiences and competencies and to expand networking opportunities for joint planning and follow-up on student placements.

In addition to its role in individual development, vocational training also offers broader societal benefits, including accelerating economic development, reducing dependence on office work, and developing local technical expertise. As the global workforce becomes increasingly interconnected, individuals can now work in various countries, creating numerous job opportunities. However, this increased competition also requires countries to develop effective education systems to meet current labour market demands. The removal of geographical boundaries means that competition will increasingly depend on educational institutions' readiness to meet corporate needs (Le et al., 2022). The readiness of vocational educators to consistently provide high levels of competence is crucial in this context. Vocational education requires educators committed to lifelong learning to prepare students to become responsible citizens and effectively participate in the workforce. Additionally, educators must possess the awareness and knowledge to promote sustainable and environmentally friendly development (Dumbiri & Permana, 2021).

To prepare for this era of globalisation, technical and vocational education must be enhanced through various approaches. Vocational education systems and practices require acceleration and transformation to align with educational models that adhere to accreditation standards for acquired competencies and integrate management across education and training (Le et al., 2022). Knowledge of skill accreditation must also be updated regularly, given ongoing technological advancements, demographic changes, and the need to remain competitive in the global market. These responsibilities cannot be ignored and are shared by all educators, not just individual ones. This is reflected in survey feedback, which indicates the extent to which they require support to address increasing challenges.

Another point to consider is that, historically, vocational education primarily focused on teaching learners existing methods and procedures (Grollmann, 2008). However, the landscape of vocational education has undergone significant changes in recent years, driven by shifts in educational theory, diverse learning environments, rapid changes in educational structures and

priorities, and evolving labour market needs. The primary responsibilities of vocational educators have expanded to include more comprehensive approaches, such as planning and preparation, facilitating teaching and learning, and assessment and evaluation.

The role of vocational educators is transforming as current educational reforms increasingly focus on bridging the gap between education and the workforce (Isopahkala-Bouret, 2010). Vocational educators are now required to work closely with industries and workplaces, acting as liaisons and trainers to facilitate hands-on learning experiences for students (Isopahkala-Bouret, 2010). This shift reflects the recognition that vocational education is no longer a separate field but a theme that extends and closely relates to national economies and workforce planning. The quality of vocational educators is a critical factor in the success of vocational education amidst these changes.

Survey results indicate that the NDPKD program positively affects educators' pedagogical and technological competencies. Respondents acknowledged significant differences in their competency levels before and after participating in the NDPKD program. These findings suggest that the NDPKD program is an effective intervention for improving the quality of vocational education. This is also evident from the high enthusiasm among educators for the NDPKD program, as they requested additional subjects and longer durations.

The implications of these findings are extensive, highlighting the importance of continuous professional development for vocational educators. Educators' pedagogical and technological competencies, with an emphasis on fostering an effective and efficient learning culture, are crucial to this transformation. Vocational education must adapt to the dynamic, rapidly changing demands of industry, and educators' pedagogical and technological competencies play a central role in this process.

However, the study also reveals several limitations that need to be considered in future program development. Constraints in time allocation, differences in initial competencies, and institutional support are factors that affect the optimisation of the program. This is consistent with previous research emphasising the importance of flexible scheduling in teacher training and support from home institutions as key to the success of competency development programs (Darling-Hammond et al., 2017; Beatty, 2018; Arleini et al., 2022; Komaro et al., 2022).

Furthermore, participants' suggestions to adjust materials by difficulty level indicate the need for a more adaptive approach to teacher training. By implementing this approach, the NDPKD program is expected to be more responsive to participants' individual needs, resulting in more effective and relevant learning experiences. These findings provide valuable guidance for program organisers to develop more flexible and personalised training modules. Institutional support is also an important factor in determining the success of program implementation. In this context, the research underscores the need for collaboration between program organisers and the educators' home institutions. Institutional support, such as dedicated training time or additional learning facilities, can enhance educators' active participation and commitment to the program. Such support will strengthen the program's impact on educators' competencies and, ultimately, the quality of learning in higher education.

CONCLUSION

The review of vocational education highlights significant challenges and opportunities in aligning educational outcomes with industry needs. Inadequate teacher competencies and misaligned curricula often hinder the effectiveness of vocational training. However, adapting to local and global trends, fostering strong partnerships between educational institutions and industries, and providing hands-on learning opportunities can enhance the relevance and quality of vocational education. Vocational educators play a crucial role in this transformation. Their ability to integrate new technologies, understand pedagogical theories, and collaborate with industry professionals is essential. Continuous professional development, supported by government initiatives and institutional backing, is vital for educators to meet the dynamic demands of the labour market. While the NDPKD program has received positive feedback from participants, it also faces challenges that must be addressed to ensure sustained success. Funding constraints remain a significant barrier, with many institutions struggling to allocate sufficient resources for continuous training. Additionally,

some lecturers report difficulties in implementing new teaching methodologies due to insufficient institutional support and outdated infrastructure. These challenges highlight the need for stronger policy frameworks and investment in vocational education development. The NDPKD program has proven effective in enhancing lecturers' competencies and strengthening collaboration between vocational education and industry. However, its long-term success is challenged by limited funding, inadequate institutional support, and outdated infrastructure. Strengthening policy frameworks and increasing institutional investment are therefore essential to ensure the program's sustainability and maximise its impact on vocational education in Indonesia..

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