A Model of Co-Creation Strategy Implementation in Supporting the Performance of Vocational Schools in West Java

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Abstract. The performance of Vocational High Schools (VHS) is an essential focus of this research, leading to continuous improvement that supports VHS as the centre of excellence. This research explores how a co-creation strategy can improve vocational school performance in West Java by examining industry challenges, teacher development, the centre of excellence strategy, and co-creation implementation. It also investigates the effects of industry challenges and teacher development on the centre of excellence strategy and co-creation implementation and how these factors impact the performance of vocational schools in West Java. This study focuses on all 288 State Vocational Schools of Center of Excellence in West Java. A random sample of 165 respondents will be analyzed using Partial Least Square (PLS) to ensure accuracy. This study has significant implications for improving vocational school performance in West Java. By examining the challenges faced by the industry, dynamic principal leadership, teacher development, and the implementation of a co-creation strategy, this research can identify areas of improvement and promote the development of vocational schools as centres of excellence. The novelty of this study lies in its focus on co-creation as a strategy for improving vocational school performance and its investigation of the interplay between industries.

Keywords: Centre of Excellence Strategy, Co-Creation Strategy, Teacher Development, Vocational School Performance.

1 INTRODUCTION

Vocational education is secondary education that prepares students particularly to work in certain fields. This understanding indicates that the output to be achieved from the Vocational High School (VHS) education process is graduates who have a certain level of skills so that they are ready to enter the world of business, industry, and work (DUDIKA) [1]. It needs a suitable model of co-creation strategy implementation to support the performance of the Vocational Schools. The main problem with vocational education is related to the goals of vocational education and efforts to achieve the goal setting. Vocational education links to preparing a ready-to-use workforce in the indus-

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trial world, even though the alignment process between the vocational education process and the industrial world in Indonesia is still not as expected [2]. In addition to harmony in the learning process, vocational education graduates, one of which is SMK, have not been able to answer the workforce needs required by the world of work. Many job opportunities the job market offers have been unfilled [3]. According to the research by [4], VHS should ideally be able to combine productive and adaptive subjects to the fullest. Not all VHSs can carry out the learning process properly. Various studies showed that the number of graduates absorbed by the world of work is less than 50%, as the discrepancy in the quality of vocational learning outcomes [5]. More than that, the picture is that the output of VHS education, especially in the soft-skills aspect, is not following the needs of the industrial world [6]. The latest data from the Central Bureau of Statistics (2023) shows that there is still a gap between the number of VHS graduates and the absorption of business and industry. Compared to graduates of other educational levels, VHS graduates have the highest contribution to the unemployment rate.

This problem is caused by the education system and the VHS curriculum, which have not been able to equip students with skills relevant to the needs of the world of work. Reference [7] argue that the quality of unemployed vocational education graduates will cause an unfavourable influence on a country's economy, so it will cause symptoms of being economically inactive. VHS performance is one of the important focuses of this research, which leads to continuous improvement to support VHS as a centre of excellence. There are five components to measure VHS performance: (1) Performance of student outcomes, (2) Performance of Industry Partnerships, (3) Performance of Curriculum Development, (4) Performance of Teacher Development, and (5) Performance of School Management [8-10]. The 8+i link and match program, categorized as the implementation of a co-creation strategy, can be viewed from the perspective of the VHS-CoE collaboration with DUDIKA. It is in line with the co-creation concept defined as a strategy of active involvement of the output end users and related parties in the entire product or service development process, from planning, implementation, and control of the services and products to the end user and other related parties [11-13]. The implementation of the co-creation strategy consists of (1) Curriculum Development, (2) Project-Based Learning (PjBL), (3) Role of Teachers/Instructors, (4) Implementation of field/industrial work practices, (5) Competency Certification, (6) Technology Update, (7) Teaching Factory, and (8) Commitment to the World of Work.

The most prominent role of educators is their support for educational institutions' main goals and objectives [14, 15]. Therefore, the educators' role in VHS (in this case, the teacher) needs to be continuously developed through teacher development to achieve the goals. Some of the components for measuring teacher development are related to (1) the Development of Professional Teachers, (2) the Development of Collaboration with Industry, (3) the Capability of Teachers in Developing Curriculum, (4) Mentoring Programs, and (5) Performance Assessment [16-18]. The achievement of VHS performance, supported by the implementation of co-creation, the centre of excellence strategy, and teacher development as an internal school environmental factor, is influenced by various industry challenges as an external school factor. Based on pre-

vious theories and research related to industrial challenges faced by educational institutions, several aspects that underlie them are (1) Regulatory Requirements, (2) Industry Partnerships, (3) Shifting Labor Market Demands, and (4) Competition [19-21]. The objectives of this study are to (1) explain the descriptions of industry challenges, teacher development, the centre of excellence strategy, co-creation implementation, and vocational school performance at VHSs in West Java, and (2) analyze the effect of industry challenges and teacher development on the centre of excellence strategy, co-creation implementation, and vocational school performance in VHSs in West Java.

2 METHODS

The objects in this study are industry challenges, teacher development, the centre of excellence strategy, co-creation implementation, and vocational school performance variables at VHS-CoE in West Java. The research subjects or units of analysis in this research are public VHSs in West Java that have implemented CoE. The units of observation (respondents) are the principal/deputy or parties who can represent them. The population framework in this study is all public Vocational Schools implementing CoE throughout West Java, totalling 288 public VHSs for drawing samples by random sampling, resulting in 165 respondents.

The instrument used in this study was a questionnaire/questionnaire with an interval scale of 5 (five) points with the appropriate statement. The validity test used to test the research instrument in a questionnaire before distributing it to the field can use construct validity using item-total correlation with the Pearson correlation formula and r-test or t-test. Meanwhile, the reliability test uses Cronbach's Alpha formula. To analyze the data, we used descriptive and inferential analysis. In the descriptive analysis concerning the mean scores, we grouped them into four categories (very low, low, high, and very high. In inferential analysis, we examined the effect of one variable on other variables using the Partial Least Squares Structural Equation Modeling (PLS-SEM) analysis technique.

Based on the framework, the main hypotheses in this study are:

1. Industry challenges and teacher development affect the Centre of Excellence strategy.
2. Industry challenges and teacher development affect co-creation implementation through the centre of excellence strategy.
3. Industry challenges and teacher development affect vocational school performance through the centre of excellence strategy and co-creation implementation.

3 RESULTS AND DISCUSSION

The research results are presented in three sections: respondent profiles, measurement models, and structural models. Respondent profiles describe the distribution of respondents in terms of gender, age, education level, and work experience.

Based on the provided respondent profile data, the key findings are as follows.

1. Gender Distribution: The survey respondents were 91 males (55.2%) and 74 females (44.8%). It indicates a slightly higher representation of males in the sample.
2. Age Distribution: The age distribution of the respondents shows that the majority falls between the age groups of 41-60 years. Specifically, 34.5% were between 41 and 50 years, and 40.0% were between 51 and 60. The age groups less than 30 years or more than 60 years had lower representation, with 4.2% and 1.8% respectively.
3. Education Level: Regarding education level, most respondents held a bachelor's degree (52.1%), followed closely by those with a master's degree (46.1%). A small percentage of respondents (1.8%) had achieved a doctoral level of education.
4. Work Experience: The work experience of the respondents was distributed as follows: 10.9% had less than ten years of experience, 39.4% had between 10-20 years of experience, 38.2% had between 21-30 years of experience, and 11.5% had more than 30 years of experience.

In the measurement models, the output results provide the construct's mean, loading, and weight values, as well as the Cronbach's Alpha (CA), Composite Reliability (CR), and Average Variance Extracted (AVE) coefficients for each variable in the model. The average scores (mean) for each construct for all variables indicate the overall level of perceived responses between 3.539 and 4,071. The loadings represent the strength of the relationship between each construct and the variables. The loadings range from 0.756 to 0.927, indicating a moderate to strong relationship between the constructs and the variables. It also applies to 'weights' measurements that indicate the relative importance of each item in the construct. These weights demonstrate the contribution of each item to the overall construct.

Each path in the model was evaluated, and the results explain that all null hypotheses are rejected based on the statistically significant p-value. It means that all alternatives of each premise in the overall model can be ***accepted*** (or not rejected). The hypotheses' acceptances confirm several previous studies regarding the topics. Based on hypotheses testing, the coefficient value of Industry challenges (X1) on Teacher Development (X2) is statistically significant. The theoretical implication of this finding explains that industrial challenges enable vocational education so that teachers can develop dynamically in linking theory and practice to the industrial environment [22].

Moreover, industry challenges require vocational school teachers to design curricula that can identify digital literacy and employability skills in the hospitality and tourism industry [23]. The output results show that Industry challenges (X1) can affect the Center of Excellence Strategy (X3). Based on industry challenges, policy initiatives can be used to improve the centre of excellence strategy in the co-creation implementation, which can be carried out jointly between academia and industry [24]. Various industrial challenges need to be overcome by internal strength to shape the direction of industry-academic collaboration in strengthening partnerships based on a centre-of-excellence strategy [25]. Regarding the significant impact of Industry challenges (X1) on Co-creation Implementation (X4), industry challenges enable the improvement of the centre of excellence strategy in the co-creation implementation between industry and academia [24]. Moreover, industry challenges can be used as a basis for organizations to develop the dynamics of implementing co-creation with external parties [26]. Figure 1 shows the full path model of the research.

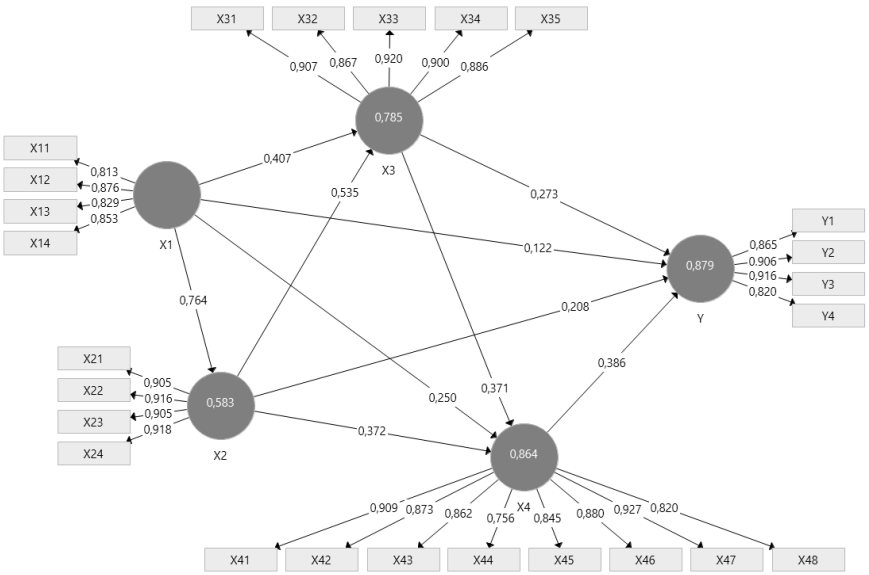

Fig. 1. Full Path Model

The Vocational School Performance (Y) is directly influenced by Industry challenges (X1). It confirms several previous studies. Industrial challenges in the Industrial Revolution 4.0 need to be used as opportunities and solutions for the world of education, especially Vocational Schools, to improve the performance of school residents and overall school performance [27]. External challenges from the industry need to be identified to identify the obstacles faced by the Center of Excellence Vocational School to improve the performance of vocational schools [28]. The effect of Teacher Development (X2) on the Center of Excellence Strategy (X3) is also statistically significant. The finding validates several previous studies. The capability development of vocational education institutions, including teacher development, has to be carried out holistically and sustainably in supporting the dynamics of the Centre of Excellence strategic planning [29]. Teacher development needs to be one of the foundations of educational institutions for developing a centre of excellence strategy that impacts their performance [30]. The finding of the significant effect of Teacher Development (X2) on Co-creation Implementation (X4) is also proven. Based on several previous studies, teacher development is the beginning of conducting practical collaboration with the industry in the co-creation implementation [31]. Adequate teacher development programs can facilitate technology adoption in schools as the basis of school-industry partnerships within the co-creation implementation framework [32].

The impact of Teacher Development (X2) on Vocational School Performance (Y) confirms several previous findings. Issues related to teacher development in developing countries need to be considered in improving student achievement and school performance [33]. Improving the quality of teacher performance through teacher development programs is believed to be crucial for improving the education system's performance as whole [34]. Center of Excellence Strategy (X3) and Co-creation Implementation (X4)

are closely related. In this sense, the quality of education relies on a centre-of-excellence strategy in increasing educational service innovation by implementing co-creation values [35]. The centre of excellence's strategic approach in a sustainable manner enables the implementation of co-creation values in the relevant industries [36]. The Vocational School Performance (Y) is significantly influenced by the Center of Excellence Strategy (X3). Several previous papers verified the proposition. The teacher development strategy needs to be carried out in conjunction with the centre of excellence strategy in improving the performance of vocational schools [37]. Implementing the centre of excellence strategy in vocational schools supported by the managerial competence of the school principal will realize the quality of vocational school performance [38]. Finally, the Co-creation Implementation (X4) significantly affects Vocational School Performance (Y), indicating several affirmations from previous authors. School-university partnership efforts can become a model for implementing knowledge co-creation in inclusive education in improving school performance [39]. The implementation of co-creation in vocational education has a different impact on teachers' teaching and student learning motivation, which is reflected in the level of school performance [40].

Nevertheless, many vocational schools in West Java face challenges in complying with regulatory requirements, especially legal frameworks and standards. Therefore, vocational schools in West Java must prioritize addressing these regulatory requirements to ensure proper school operation. It can foster a conducive learning environment for students and enhance vocational school performance. The development of professional teachers at vocational schools in West Java is not as good as the planning due to several factors. The development of professional teachers at vocational schools in West Java has encountered challenges that have hindered its progress, like limited access, the absence of a comprehensive and structured teacher development framework within the vocational school system, administrative burdens, and the absence of collaboration and partnerships between vocational schools and industry stakeholders.

The current school's capability to employ the SWOT is still low in analyzing the Center of Excellence Strategy. When vocational schools want to be the centre of excellence, the strategy must be planned and implemented well. One of the main obstacles is the lack of knowledge and skills among school administrators and staff in conducting a thorough SWOT analysis. The lack may hinder their ability to identify and leverage the strengths and opportunities within the school environment while mitigating weaknesses and threats that impede progress. Interestingly, in co-creation implementation, the implementation of field/industrial work practices appears to be enhanced first before the other factors. The enhanced implementation of field/industrial work practices in co-creation implementation reflects the recognition of the importance of practical experiences and industry collaboration in vocational education. While this emphasis is valuable, it should be complemented by attention to other factors to maximize the benefits for students, teachers, and industry stakeholders. In the context of vocational school performance, it is evident that several schools continue to face challenges in school management, particularly in learning process management, funding management, and resources management. These difficulties can impact the overall effectiveness and efficiency of vocational education delivery. Thus, in each factor, school administrators can make some improvements.

4 CONCLUSIONS

The findings indicate that industry challenges have a significant impact on teacher development, the centre of excellence strategy, co-creation implementation, and vocational school performance. Teacher development is highlighted as crucial in improving the centre of excellence strategy, co-creation implementation, and overall vocational school performance. The relationship between the Center of Excellence Strategy and Co-creation Implementation is emphasized, as they contribute to educational service innovation and the implementation of co-creation values in relevant industries. Vocational School Performance is significantly influenced by the Center of Excellence Strategy, emphasizing the importance of teacher development aligned with the Center of Excellence strategy for improved vocational school performance. Co-creation Implementation also plays a significant role in vocational school performance, with school-university partnerships and the implementation of knowledge co-creation positively impacting school performance.

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