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Challenges and Opportunities in Implementing the Teaching Factory Model in Special Needs Schools: Alternative Work Readiness for Students with Disabilities

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Abstract: The intense job competition and the low absorption rate of special needs school graduates in the business and industrial sectors are allegedly due to the ineffective implementation of the link-and-match concept. This study aims to analyze the challenges and opportunities faced by special needs schools in preparing students for the workforce through the Teaching Factory (TEFA) model. Using a descriptive qualitative method, data were collected from two principals and six vocational skills teachers through interviews, observations, and document analysis. The results indicate that teacher competence in mastering vocational skills remains low, the curriculum oriented toward Competency-Based Training (CBT) and Production-Based Training (PBT) has not been properly accommodated, and infrastructure and financial resources are limited. However, several opportunities were identified, including principals' good understanding of the TEFA concept, extensive partnerships with related institutions (Vocational High Schools and industries), vocational skills programs developed based on needs assessments, and vocational skills roadmaps aligned with school visions and missions. The study concludes that the main challenges faced by special needs schools revolve around human resources, financial resources, service programs, and infrastructure, while opportunities exist in human resources and service programs. These findings highlight that special needs schools continue to face significant obstacles in effectively implementing the TEFA model to prepare students for employment. Therefore, a proper and comprehensive analysis is necessary to identify operational strategies that can minimize challenges and maximize opportunities for special needs education in implementing an adaptive and accommodating TEFA model.

Keywords: Teaching Factory Model; Students with Disabilities; Vocational Skills; Work Readiness.

INTRODUCTION

Vocational High School, as an institution providing vocational education, serves as a barometer in preparing graduates for the workforce. Many vocational high school graduates are not absorbed in the industrial sector (Prianto & Qomariyahet al., 2021). Data from the Central Statistics Agency in 2020 showed that the open unemployment rate among vocational high school graduates reached 13.55% (Pikiran Rakyat, 2022). As of 2022, the open unemployment rate for vocational school graduates, particularly in West Java, remained around 11.16%, still higher than that of graduates from other education levels (Pikiran Rakyat, 2022). Other data indicated that there were 10 million job seekers, not including those who dropped out of junior high school, high school, or special needs schools (Pikiran Rakyat, 2022).

The low employment rate of people with disabilities in their productive age is illustrated by a survey conducted by the Association of Indonesian Disabled Persons, as reported by the Tribunnews website, which found that the employment ratio of people with disabilities in Indonesia is below 0.5%. The Central Statistics Agency in 2020 recorded that only 0.18% of the population aged 15 and over with disabilities were employed. This percentage decreased by 0.1% compared to the previous year. A survey based on the ICF instrument (International Classification of Functioning, Disability, and Health developed by WHO) conducted in 14 provinces in Indonesia shows that most people with disabilities do

not enter the workforce (Marjuki, 2010). In Romania, the employment rate of people with disabilities remains low at 12.7%, and the unemployment rate among persons with disabilities is twice as high as that of non-disabled individuals (Angela, 2014). Competition between persons with disabilities and non-disabled individuals in the job market further exacerbates the issue, making the unemployment rate for people with disabilities more than twice that of non-disabled individuals (Blazquez & Malo, 2005).

Efforts undertaken by special needs schools to prepare students for employment in the business and industrial sectors have been implemented through the development of vocational skills programs (Permana, Prihatin, & Aprilia, 2018; Aprilia & Soendari, 2020), the creation of a vocational-based life skills education management model to equip students with disabilities for the workforce (Permana, Prihatin, & Aprilia, 2018), and the implementation of work systems for persons with disabilities in companies (Aprilia & Pangestu, 2021). However, these programs and systems have not been fully effective in making students skilled and productive. People with disabilities often lag behind their peers in developing life skills (Gall, Kingsnorth, & Healy, 2006). Even though they are equipped with various knowledge and practical training, they often lack opportunities or real-world experiences to familiarize themselves with actual workplace settings (King, 2010; Yusof, Ali, & Salleh, 2015). Therefore, special needs schools need to create a learning environment that replicates real business and industrial conditions. This can be achieved by developing learning models based on production or service-oriented training that follows industry-standard procedures and regulations (Purwanto, Novitasari, & Asbari, 2022).

Most importantly, such evident conditions should be accompanied by various strategies, as exemplified by the Malaysian government's development of a technical vocational education and training system (Yusof, Ali, & Salleh, 2015) and Brazil's implementation of the Workplace Adaptation program, an assessment initiative aimed at aligning job availability in companies with the needs of individuals with disabilities (Guimarães, Martins, & Junior, 2015). In Indonesia, the Directorate of Vocational High Schools (Directorate of PSMK) introduced the Teaching Factory (TEFA), a workplace-based learning model (Hidayat, 2011; Wafroturrohmah et al., 2020). Keenan et al. (2014) demonstrated that life skills programs have been effective in supporting the skill development of students with disabilities and helping them transition into adulthood.

Creating and providing job opportunities, whether by preparing students with disabilities for employment in companies or equipping them for entrepreneurship, is a complex process that requires careful planning and execution (Aprilia et al., 2019). It is crucial to implement an appropriate intervention through a model design based on a collaborative, comprehensive, and integrated learning approach that bridges the gap between the skills taught in schools and the actual skills needed in the business and industrial sectors.

The Teaching Factory (TEFA) model, developed in vocational high schools, offers an alternative approach to fulfilling the skill requirements and criteria demanded by industries (Mavrikios et al., 2019). The teaching factory is a learning concept that simulates real workplace conditions to bridge the competency gap between school-based knowledge and industry needs (Chryssolouris et al., 2016). This model integrates competency-based training (CBT) and production-based training (PBT), ensuring that skills and processes (life skills) are designed and implemented following real-world work procedures and product standards that meet market and consumer demands (Stavropoulos, Bikas, & Mourtzis, 2018; Mourtzis et al., 2018).

This research focuses on exploring the opportunities and challenges faced by special needs schools in implementing the Teaching Factory model, particularly about human resources, financial resources, service programs, and infrastructure. The objective of this study is to assess the readiness of special needs schools in preparing students with disabilities for the workplace through the Teaching Factory model. The school profiles generated from this investigation will serve as the foundation for developing an adaptive and accommodating Teaching Factory model that equips students with disabilities for employment and enhances their quality of life.

METHOD

This study employs a descriptive qualitative method. Data were collected through interviews, observations, and document analysis involving two principals, six vocational skills teachers, and skills unit coordinators from two special needs schools: SLB Negeri (SLBN) Cicendo in Bandung City and SLB Negeri A Citeureup in Cimahi City. These schools were selected based on their diverse student populations and best practices in implementing vocational skills programs. The research instrument consisted of a set of open-ended questions addressing the opportunities and challenges faced by special needs schools in terms of human resources, financial resources, service programs, and infrastructure. The collected data were analyzed qualitatively through the processes of data reduction, data display, and conclusion drawing/verification.

FINDING AND DISCUSSION

Finding(s)

The implementation of the TEFA model as an alternative for special needs schools in preparing students for the workforce focuses on exploring challenges and opportunities in four key aspects: human resources, financial resources, service programs, and infrastructure.

Human Resources (HR)

One of the primary challenges in implementing the teaching factory in special needs schools is the limited availability of qualified human resources. Teachers responsible for vocational skills instruction typically come from special education backgrounds rather than expertise in specific vocational fields. According to Principal 1 (Mr. Sdrmn), "*This condition affects teaching productivity.*" Similarly, Principal 2 (Mr. Wwn) stated, "*Special needs school teachers do not have the qualifications to teach vocational skills, yet the schools must continue to serve their students.*" Moreover, schools lack the autonomy to recruit teachers with the necessary vocational qualifications.

Another challenge concerns students' soft skills, which remain underdeveloped. Based on interviews with teachers at SLBN Citeureup, Mrs. Rn noted, "*Some students lack confidence, give up easily, and get bored quickly, making it difficult to push them to study.*" Mr. AS added, "*Some students participate in internships and even start working, but they do not last long due to difficulties in making friends. However, some students are productive, diligent, and perform well but struggle with financial management.*" At SLBN Cicendo, Mrs. Wwn highlighted another issue: "*Many students lack communication and socialization skills.*"

Despite these challenges, school principals generally have a strong understanding of the importance of implementing the TEFA model. According to Mr. Sdrmn, principal of SLB N Citeureup Cimahi, "*The teaching factory is a priority for schools, particularly at the special needs high school level, to ensure students are prepared for both employment and*

entrepreneurship." This view was reinforced by Mr. Wwn, principal of SLB N Cicendo Bandung, who stated, "*The successful implementation of the teaching factory requires school readiness, adequate infrastructure, and competent teachers.*"

To address these challenges, schools have made efforts to collaborate with external institutions. SLBN Cicendo has partnered with SMKN 9 Bandung in the fields of Catering and ICT, as well as organizations such as Save The Children and the IBU Foundation to provide soft skills training for teachers and students. Additionally, SLBN Cicendo has developed an entrepreneurship program in collaboration with Bio Farma, which provided sewing machines, and Pelita Masa, which supplied instructors. Similarly, SLBN Citeureup has established partnerships with SMKN 9 and SMKN 2 Cimahi in the automotive sector. Another notable collaboration at SLBN Cicendo is with the Indonesia Chef Association (ICA), which offers culinary coaching clinics, competency tests, and culinary certifications.

Financial resources

The sustainability of the Teaching Factory (TEFA) model heavily relies on financial resources. According to Mr. Sdrmn and Mr. Wwn, "*Schools face significant financial limitations, particularly in maintaining the sustainability of various vocational skills programs.*" Mr. Wwn further explained, "*Funding is primarily sourced from BOS funds and government block grants; however, these are insufficient to fully cover production costs and equipment maintenance.*"

Some schools attempt to generate additional financial support through their vocational programs. At SLBN Citeureup, Mr. AS, an automotive skills teacher, stated, "*The school earns some income from automotive services and workshops to help cover production and maintenance costs, although it is not always sufficient.*" Similarly, at SLBN Cicendo, Mrs. Wn, a culinary skills teacher, explained, "*Operational and maintenance costs for equipment are funded through the sale of cakes.*" She added, "*When there is a high volume of orders, the revenue can cover production costs, including purchasing materials and tools, maintaining equipment, and even providing pocket money for students.*"

Service Program

Regarding the curriculum for special needs high schools, both Mr. Sdrmn and Mr. Wwn agreed that the school curriculum is designed with a focus on skills development (60%) and academics (40%). They emphasized that vocational skills development begins with assessment and planning, followed by the creation of a structured vocational skills learning program.

According to Mr. Wwn, "*SLBN Cicendo is developing a roadmap for vocational skills programs, which includes extracurricular activities, street vendors, internships, entrepreneurship education, and soft skills training, as well as expanding partnerships with external institutions.*" Furthermore, both Mr. Sdrmn and Mr. Wwn concurred that "*the implementation of the 2013 curriculum for vocational skills programs at the high school level is structured through specialization in the form of extracurricular activities, fieldwork programs, and internships.*"

Infrastructure

The provision and arrangement of infrastructure for the Teaching Factory program remain minimal, as acknowledged by both principals. Mr. Sdrmn stated that "*several infrastructure facilities have not been utilized optimally, particularly in beauty skills, souvenirs, and culinary arts.*" However, he also noted that "*schools have strengths in the field of automotive and repair services.*"

Observations at SLBN Citeureup indicate that the infrastructure for automotive and workshop training, including work/practice facilities and equipment, meets the minimum requirements. Additionally, the strategic location arrangement allows for easy consumer access. Meanwhile, at SLBN Cicendo, Mr. Wwn explained that "*the school is committed to developing culinary skills as its flagship program.*"

Based on observations and documentation studies, the school has made efforts to enhance its catering production infrastructure, including work/practice facilities, equipment, and providing complete work tools for students and teachers. However, Mrs. Wn, a culinary skills teacher, acknowledged that "*some production equipment remains unused due to mismatched capacity and size.*"

Discussion(s)

The commitment and understanding of school principals play a crucial role in the sustainability of the Teaching Factory (TEFA) model in special needs schools. The study shows a high level of commitment from both principals and teachers in establishing systemic partnerships with other institutions in a structured, integrated, and sustainable manner.

Given the limitations in human resources and infrastructure, collaboration between special needs schools, vocational high schools, and industries is essential. Such partnerships expand teachers' knowledge and experience, equipping students with the necessary skills and competencies to enter the workforce. TEFA requires active industry involvement to ensure graduates meet the job market's expectations (Rentzos, Mavrikios, & Chryssolouris, 2015). Strategic partnerships must be mutually beneficial, long-term, efficient, and effective (Stavropoulos et al., 2018). For special needs schools, these partnerships help update knowledge on technological advancements and dynamic industry practices, ensuring alignment between school training and market needs (Chryssolouris et al., 2016).

The involvement of vocational high schools as vocational partners is vital, as they share a similar academic environment with special needs schools. Collaborating with well-established vocational high schools enables special needs schools to adopt and adapt best practices in vocational education (Mei, 2023).

Addressing the shortage of skilled vocational teachers requires not only training programs or external instructor recruitment but also formal government intervention. Policies should facilitate the recruitment of non-special education teachers with relevant vocational expertise to work in special needs schools. Additionally, the government must create a structured mechanism to synchronize the efforts of special needs schools, vocational high schools, job training centers, and industries (Aprilia & Pangestu, 2021).

Implementing TEFA within the special needs school curriculum requires a competency-based training (CBT) and production-based training (PBT) approach. Schools must modify and adapt their curriculum to align with industry demands while considering the unique needs of their students. A thorough needs assessment is crucial to ensure relevance (Permana, Prihatin, & Aprilia, 2018). The curriculum should incorporate work-based learning (WBL) principles, enabling students to develop workplace adaptability skills (Aprilia & Pangestu, 2021).

Workplace adaptability is a key determinant of success in the industry. Employees must demonstrate responsibility, flexibility, strong communication skills, self-evaluation abilities, and an awareness of health and safety (Brady, 2010; Aini et al., 2023). Additionally, qualities such as efficiency, creativity, and innovation are essential (Tjiptady, Yoto, & Tuwoso, 2019). Therefore, both hard and soft skills must be taught explicitly and in an integrated manner (Levinson & Palmer, 2016; Sutianah, 2021; Annisi, Aprilia, & Homdijah,

2023). Most employers seek a balance of these competencies in their workforce (McPherson et al., 2018; Sutianah, 2021).

Sustaining the TEFA model requires strong financial and managerial support. Schools need effective investment and financial planning strategies to manage operational costs, income generation, and resource allocation. Special needs schools rely on limited government funding and revenue from their products and services. Thus, schools must optimize their production units to generate additional income for equipment maintenance and staff development (Kuswantoro, 2014). To achieve this, schools must establish functional facilities such as factory units, training workshops, showrooms, and entrepreneurial learning spaces (Diwangkoro, 2020). Ideally, at least 75% of vocational training infrastructure should be dedicated to business and production activities that meet industry standards in terms of quality, quantity, utilization, and maintenance (Sutianah, 2021). Currently, the availability and utilization of vocational training infrastructure in special needs schools remain suboptimal. Although schools can leverage facilities from vocational partner institutions, independent infrastructure development—supported by government policies and funding—is crucial for long-term sustainability.

CONCLUSION

The study identifies four major challenges faced by special needs schools in implementing the Teaching Factory (TEFA) model: human resources, service programs, financial resources, and infrastructure. Specifically, these challenges include a shortage of skilled and productive teachers, a lack of teachers with the required educational background, incomplete implementation of competency-based training (CBT) and production-based training (PBT) within the curriculum, and insufficient financial and infrastructure support to sustain production-based learning.

Despite these challenges, there are significant opportunities for improvement, particularly in the areas of human resources and service programs. School principals have a good understanding of the TEFA concept, which provides a strong foundation for its implementation. Additionally, special needs schools are actively forming partnerships with various institutions, conducting vocational skills development based on needs assessments, and designing vocational skills roadmaps aligned with their vision and mission. These opportunities, if optimized, can support the sustainability and effectiveness of the TEFA model in special needs schools. Based on the analysis and conclusion, the recommendations are as follows:

1. For researchers
   a. Identify other objective conditions that have not been explored in detail and map out other aspects/variables in the implementation of the TEFA model such as context, input, process, and product as a contribution to the development of an adaptive and accommodating teaching factory model.
   b. Explore the profile of special needs schools and other students with disabilities more broadly to achieve more comprehensive generalizations and benefits.

2. For Schools
   a. Evaluate and develop a follow-up plan by mapping the opportunities/potentials and challenges/obstacles of teaching factory implementation.
   b. Create a vocational skills roadmap by the school's vision and mission.
   c. Coordinate with the government and stakeholders (vertical institutions) and with vocational/business and industrial world partners (horizontally) intensely and synergistically to achieve the optimal teaching factory implementation criteria.

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