



---

---

## Center of excellence assistance model: Is it effective to improve vocational school management in Central Java?

Sucipto\*, Sandy Arief, Anis Susanti

Universitas Negeri Semarang, Indonesia

\*Corresponding Author: [sucipto@mail.unnes.ac.id](mailto:sucipto@mail.unnes.ac.id)

---

### ABSTRACT

---

The Centre of Excellence Vocational High School (CEVHS) is a program to develop vocational education and prepare students with skills more relevant to society's needs, which are constantly changing according to industry, business, and workplace developments. This research aimed to analyze the Centre of Excellence's assistance effectiveness in improving the quality of vocational school management in Central Java. Through a quantitative approach, this study involved CEVHS teachers in Central Java from a sample of 21 CEVHSs assisted by lecturers from Universitas Negeri Semarang. The data were collected through a questionnaire and analysed using the t-test. The test results indicate  $\text{sig } 0.000 < 0.05$ , meaning that the resulting value has experienced Very Good development. Therefore, there is a positive relationship before and after mentoring at CEVHSs, and CEVHS needs assistance in managing the school and improving school quality. More attention and supervision while implementing assistance is vital to enhance vocational school management.

**Keywords:** center of excellence, student skill, vocational school management

---

#### Article history

Received:

14 March 2024

Revised:

8 May 2024

Accepted:

2 August 2024

Published:

20 September 2024

---

**Citation (APA Style):** Sucipto, S., Arief, S., Susanti, A (2024). Center of excellence assistance model: Is it effective to improve vocational school management in Central Java? *Cakrawala Pendidikan: Jurnal Ilmiah Pendidikan*, 43(3), 619-629. DOI: <https://doi.org/10.21831/cp.v43i3.74834>

---

### INTRODUCTION

Vocational High School (VHS) is a secondary-level education that aims to develop its graduates' work-related skills. To support its function, the government established the Centre of Excellence Vocational High School Program (CEVHS) in 2021 based on the Minister of Education and Culture Decree Number 17/M/2021 (Kemendikbud Ristek, 2021). The program focuses on developing vocational education institutions to become increasingly relevant to the demands of constantly changing society and business and workplace industry or *industry dunia usaha dan dunia kerja (iduka)*. As vocational education has become a good choice for students who want to find a job immediately after graduating from school, it can be a shortcut for them to enter the world of work directly (Abdurrahman et al., 2022).

Apart from that, VHS has been capable of supporting its learning process regularly and continuously. This is in line with the idea that the learning process should equip students with the knowledge, skills, and values to be transformed into competent students (Bakar, 2018). Mobilizing schools at primary, junior, and high school levels has been carried out, and CEVHS exists for vocational high schools. The VHS curriculum was prepared together in line with strengthening aspects of soft skills, hard skills, and work characteristics based on the world of work needs because the program aims to produce graduates whose quality and performance are in line with the competencies required in the current world of work and become a reference for other schools. This CEVHS program aims to improve quality and performance, creates a center for enhancing quality and performance, becomes an inspiration, and produces graduates who are ready to work and can implement in-depth and comprehensive vocational education alignment.

CEVHS has a Center of Excellence (COE) laboratory building designed like the work environment of industrial partner companies to improve the infrastructure and facilities for learning practices that are standard for the world of work. The laboratory is a facility needed by students to carry out practical activities. In the context of vocational education for the field of technical expertise, a laboratory is often referred to as a workshop, namely a hub to train students' skills, which can generally be used for practice, discovering the latest techniques, repairing and maintaining equipment as well as a place to produce something (Ardian et al., 2020). To practice skills, students must go through three phases, namely the cognitive phase, which requires instruction; the associative phase, which requires practice and feedback; and the autonomous phase, when skill performance becomes almost automatic (Sanchez, 2022). Meanwhile, skills need to be practiced and strengthened because the more practice you get, the more skills will improve (Gazzard, 2011; Hensiek et al., 2016). Furthermore, vocational school practical learning is currently carried out using project-based learning following material related to industry needs.

The Centre of Excellence Vocational High School Program aims to produce workable graduates for the world of work or become entrepreneurs through in-depth and comprehensive alignment of vocational education with the world of work and is expected to become a center for quality improvement and reference for other Vocational Schools (Arika et al., 2023). The program aims to improve quality and performance, create a center for enhancing quality and performance, become an inspiration, produce work-ready graduates, and achieve in-depth and comprehensive vocational education alignment (Subandi, 2021). It is hoped that this activity will be able to strengthen partnerships with the Ministry of Education and Culture in assisting CEVHS programs, increasing efficiency by using digital platforms, producing improvements in students' soft and hard skills that suit the world of work needs and have Pancasila character values; improving learning practice infrastructure to standards in the world of work; and realizing data-based planning through school management (Susatya et al., 2023).

The assistance forms carried out in the CEVHS programs include (a) coordination with related units/departments, (b) assistance in fulfilling eight national education standards and implementing link and match with the world of work, (c) facilitation and/or training for in-house implementation training (IHT), (d) facilitation of the community-based learning implementation, (e) assistance to vocational school principals in implementing the program, (f) assistance in technology use for school principals and teachers, and (g) preparation, monitoring, evaluation and implementation follow-up on learning achievements. Some assistance programs, such as curriculum implementation, effectively improve teachers' ability to carry out learning (Raharjo, 2020). The dynamic change in curriculum needs to be assisted in ensuring that implementation is linked and matched with industries in some aspects, such as teachers' professional development, student empowerment, parent and community involvement, technology use in learning, and increasing student creativity (Fatmawati, 2024).

CEVHSs have received assistance from universities to carry out activities following the objectives of their programs, analyze strengths and weaknesses, and develop their potential for human or other resources. This assistance is also expected to help achieve the goals of their program and further plan, implement, and evaluate effective and efficient activities. After the assistance has been implemented, an evaluation needs to be carried out to see the effectiveness of the activity. Therefore, it is necessary to investigate the effectiveness of the CEVHS assistance model in improving the quality of VHS management, specifically in Central Java, Indonesia.

## **METHOD**

This study employs a quantitative research design, focusing on the analysis of numerical data to investigate significant relationships between the variables. The objective is to generate conclusions that elucidate the characteristics and dynamics of the object under investigation. A questionnaire was distributed to the principals of CEVHSs to gather their perceptions regarding the effectiveness of the CEVHS assistance model in enhancing vocational school management. Descriptive percentages were used to provide an overview of the data. At the same time, a t-test was conducted to evaluate the effectiveness of the CEVHS assistance program and assess the

partial impact of the independent variable on the dependent variable. The analysis involved comparing the t-value with the critical value from the t-table. If the t-value exceeds the critical value, with a significance level of less than 0.05 ( $\alpha = 5\%$ ), the independent variable is considered to have a significant partial effect on the dependent variable.

## **FINDINGS AND DISCUSSION**

The learning process portion in a vocational school environment is 30% theoretical learning and 70% practical experience, designed to immerse students in real-world fieldwork activities. Teamwork will increase a sense of belonging and strengthen the connection between people, which is essential for collaborative learning environments. Project-based learning should be supported by all school members and the teacher's commitment to learning activities for active and skilled students completing a given project. Through project-based learning, it is hoped that students can learn actual competencies or skills (Roemintoyo & Budiarto, 2023).

In implementing the Center of Excellence Programs (CEP), there must be a firm commitment between the CEVHSs, the industrial world, and universities as program companions. Through this collaboration, all teaching and education staff can work together to emulate good practices from work to school. The hope is that when students transition to the workforce, they are well-prepared and familiar with industry expectations, resulting in better employment outcomes for vocational school graduates. With effective school management, an influential institution will develop independently because the institution has been given greater authority and responsibility in managing human and other resources. Teachers are the most important human resources in the department and have significant influence in providing quality instruction and guiding students. In this context, the importance of teacher professional development and skill enhancement is to improve the quality of education (Farizi & Patimah, 2023). The managerial presence in the institution can support the sustainability of its management system and help it become more agile. It can provide support for an effective and efficient learning process so that it will impact the quality of education.

Implementing CEVHS assistance is based on the "8+I" link and match. First, the curriculum is prepared to strengthen soft skills, hard skills, and work characteristics according to work needs. Second, learning is pursued based on real projects from the world of work (PBL) to ensure hard and soft skills and strong character. Third, increasing the number and role of teachers/instructors from industry and experts from the world of work. Fourth, field/industry work practice for at least one semester. Fifth, for graduates and teachers/instructors, competency certification must be under the standards and needs of the world of work. Sixth, teachers/instructors need to emphasize updating technology through regular training. Seventh, applied research is conducted to support teaching factories based on cases or needs. Eighth, there is a strong commitment to absorb graduates into the world of work.

Meanwhile, the letter "i" represents a variety of collaboration possibilities that can be carried out in the work world. Achieving the link and match objectives necessitates comprehensive preparations, particularly strengthening infrastructure and practical tools. Schools that attain Center of Excellence status are expected to serve as trainers or mentors for other vocational institutions, further enhancing the vocational education system.

The technical meaning of excellence in the early stages is by implementing link and match, strengthening human resources, and strengthening facilities and infrastructure. The emphasis on the stigma of excellence is not on favorite, exclusive, or superior schools. However, the CEVHSs became a vocational school and were later tasked with advancing other vocational schools. CEVHS implements the "Freedom to Learn" curriculum. The curriculum, namely vocational subjects, reaches 70% compared to theoretical subjects. Then, emphasis is placed on soft skills and work readiness characteristics. The Merdeka Belajar philosophy is also stated and covered in all subjects. Furthermore, project-based or authentic project-based learning is implemented to achieve several things. Among these are the character of soft skills that are balanced by industry needs, competency certification that is recognized by industry, field work practice or internship for at least one semester, and industry that is actively involved starting from curriculum

preparation, teaching, internships to absorption commitments, and the development of applied research.

**Table 1. The implementation of 8+i Link and Match** (Rahman et al., 2021)

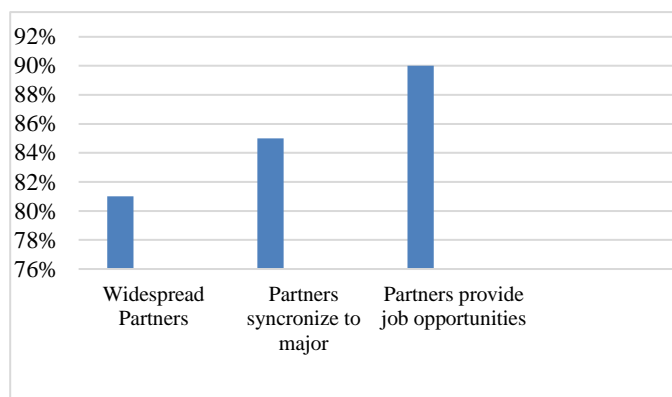
No	Implementation of Link and Match
1	The curriculum is prepared with the industry
2	Project-based learning (PBL) synchronizes with industries to ensure hard skills will be completed with soft skills and strong characters
3	Increasing the number of teachers/lecturers/instructors from experts in the work world of work (business and/or industry) to teach in vocational education entities at least 50 hours per semester per study program
4	Internship or work practice for vocational students in the world of work (business and/or industry) minimum one semester
5	Competency certification that is in line with the standards and needs of the world of work (business and/or industry), which is intended for graduates of vocational education as well as teachers/lecturers/instructors
6	Teachers/lecturers/instructors regularly receive technology updates and training from the world of work (business and/or industry)
7	Applied research on vocational campuses that originates from real cases or needs in the world of work (business and/or industry) and society (as the basis for teaching industry and teaching factories) in collaboration with the world of work and stakeholders
8	Commitment to absorption of vocational education graduates by the world of work (business and/or industry)
9	Various possibilities of cooperation can be carried out with the world of work (especially industry), among others: scholarships and/or official ties, donations in the form of laboratory equipment, and others.

### Findings

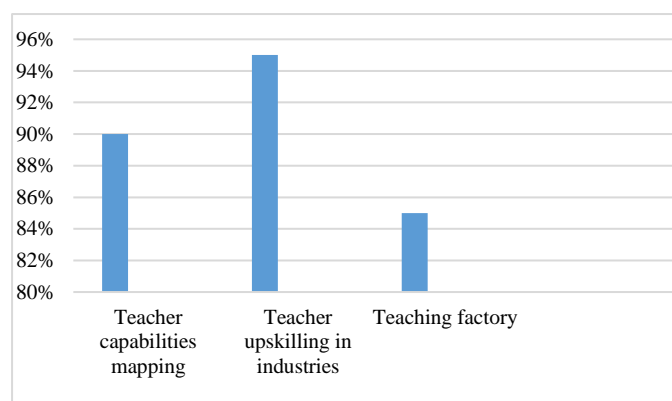
The questionnaire results showed that 21 CEVHSs had experienced improvements in school management after receiving assistance. It can be seen in the following diagram. Aspects of strengthening partnerships between the Ministry of Education and Culture and local governments in assisting the CEVHS program are visualized in Figure 1.

The diagram illustrates that out of the 21 Center of Excellence Vocational High Schools (CEVHSs) that received assistance, 17 schools (81%) have strengthened their partnerships with industry. This demonstrates that the CEVHS assistance program has effectively broadened schools' understanding of cultivating relationships with the professional sector, facilitating smoother transitions for graduates into internships or direct employment. Additionally, 18 CEVHS programs (85%) have expanded their partnerships to align with the specific majors offered at the schools, enhancing their attractiveness to students and industry stakeholders. The alignment of partnerships with school majors increases the likelihood that graduates will secure employment within their field of study. Moreover, 19 CEVHS programs (90%) have successfully developed partnerships that have advanced to offer job opportunities to high-achieving graduates, which has significantly impacted the schools. The CEVHS assistance has thus led to substantial improvements in the breadth and quality of partnerships. These strengthened collaborations with industry partners have resulted in a positive and significant relationship between industry involvement and the enhancement of student competencies (Sumbodo et al., 2019).

Strengthening the partnership between the Ministry of Education and Culture and local governments in assisting the CEVHS Program has significantly improved. It can be seen from the increase in the number of school partners. Partners established according to majors at school have increased. The number of partnerships aligned with the specific majors offered at vocational schools has expanded, providing students with more business opportunities. This is because CEVHSs to broaden their partnership networks with industries relevant to each department within the school. After assisting with the CEVHS program, the school started moving and opened partnerships to help future graduates. Aspects of strengthening the quality of vocational school human resources include vocational school principals, school supervisors, and teachers, who need to realize management and learning based on the world of work (Figure 2).



**Figure 1. The Way Vocational Schools Strengthen Their Partnership**



**Figure 2. Vocational School Strategy to Strengthen Their Teacher Capabilities**

Based on Figure 2, it can be seen that of the 21 CEVHSs that received assistance, 19 schools (90%) have mapped out the teachers they plan to send for training. Additionally, 20 CEVHS (95%) have selected training programs that align with the needs of the Business and Industrial World (DUDI), and 18 CEVHS programs (85%) have established teaching factories in collaboration with industry partners. Regarding aspects of the vocational school human resources quality, including vocational school principals, school supervisors, and teachers, to realize management and learning based on the world of work, schools are making extraordinary efforts to carry out updates to improve their human resources quality. The targeted training program is intended to provide experience to students and emphasize the teachers' potential as leaders for their colleagues (Arwildayanto et al., 2023).

The school has effectively mapped out teachers for industry-relevant training and selected appropriate training programs tailored to the needs of various sectors. In addition, the school has implemented the Teaching Factory (TEFA) learning model, which equips students with competencies aligned with industry performance standards. TEFA learning provided students with the necessary competencies that align with the industry's performance criteria, boosted their self-confidence and learning motivation, and fostered a mental attitude of independence, responsibility, and self-efficacy in meeting industrial needs (Rosidah & Sutirman, 2023).

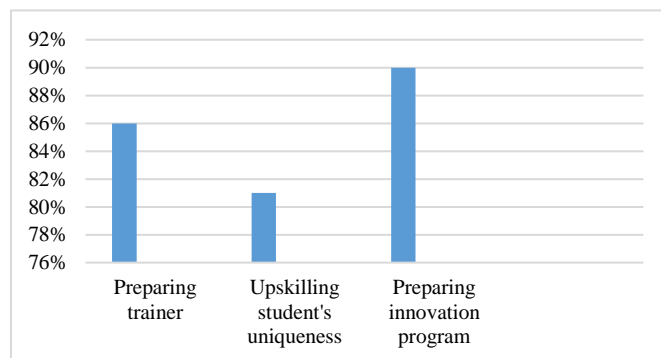
Aspects of strengthening the competency of students' non-technical skills (soft skills) and technical skills (hard skills) follow the world of work needs and develop character under the Pancasila values. Of the 21 CEVHSs that have received assistance, 8 (86%) offer soft skills training to students, while 17 (81%) focus on developing students' interests and talents. Furthermore, 19 CEVHS programs (90%) provide additional soft skills training to enhance employability after graduation. The next thing is related to the competency of students' non-technical skills (soft skills) and technical skills (hard skills), which follow the world of work needs and develop character under the Pancasila values. The school tries to organize soft skills training for students so that CEVHS Program graduates can be well-absorbed and have adequate hard and

soft skills. The school facilitates students' development of their interests and talents and provides soft skills training as accompanying skills after graduating.

Non-technical or soft skills are personal skills, namely special skills that are non-technical, intangible (invisible), and personality that determine a person's strength as a leader, listener, negotiator, and conflict medium (Budinarsih et al., 2020). Soft skills are also considered interpersonal skills, such as communicating and working with groups. The soft skill indicators in this research are 1) communicating, 2) building cooperation, 3) work attitude, 4) problem solving, and 5) implementation of a working code of ethics. From the aspect of laboratory use, learning productive subjects can improve collaboration skills because it allows students more freedom to interact in groups to solve problems found during practice. It follows the research results by Rosana (Rosana et al., 2014), which stated that through laboratory use, students can work together and help each other master the procedures for using the practical tools in the laboratory.

In this research, hard skills are inherent or needed by students to carry out their work well by the selected skill competencies. Hard skills are necessary in the world of work to produce maximum work results. Technical skills are used as the basis for changes in technology mastery (Dewi & Sudira, 2018). Technical skills in applying special skills needed at work, with indicators: 1) utilizing technological equipment; 2) carrying out work procedures; and 3) dealing with work disruptions (Misra & Khurana, 2018).

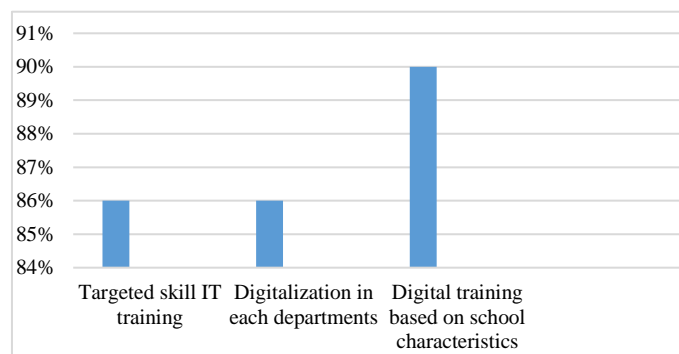
Regarding students' hard skills, the laboratories used for practical learning of productive subjects are considered to increase students' ability to utilize technology following the competencies they must master. For example, from business management expertise, students learn to manage digital archives, while those in technical fields gain experience with industry-standard tools. These competencies align with the skills needed in the 21st century, namely critical and creative thinking, character development, and technological proficiency (Nurcahyono et al., 2022).



**Figure 3. Realization of Data-Based Planning Through School-Based Management**

Based on Figure 3, of the 21 Center of Excellence Vocational High Schools (CEVHSs) that received assistance, 16 (76%) have implemented specific skills training for students to equip them for post-graduation careers. Additionally, 18 CEVHS programs (86%) have focused on strengthening the skills students acquire, tailored to the unique characteristics of each school. Furthermore, 18 CEVHSs (86%) are developing new programs to address current industry trends and demands.

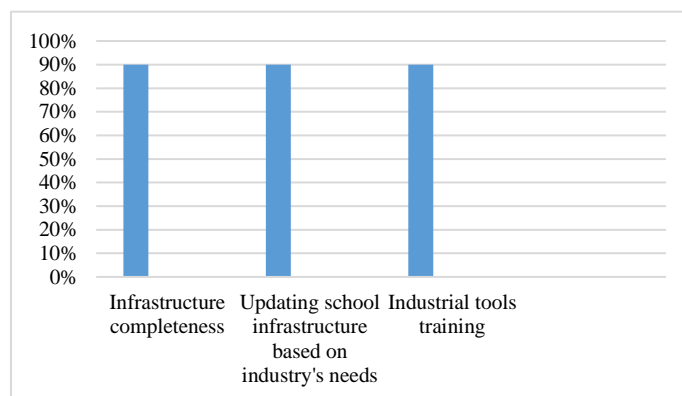
Aspects related to data-based planning through school-based management have also developed very well. It is done through the school's efforts to prepare specific skills trainers for students as provisions after graduation. The school strengthens the skills students master based on the school's characteristics. CEVHS Program shows its excellence by presenting graduates ready to absorb well and with quality. The school prepares new programs based on current developments. The effect of school-based management on employment competitiveness shows that six elements help students become more competitive, including strong school-community ties, curriculum that adheres to industry standards, qualified teachers, modern facilities and infrastructure that meets industry standards, availability of adequate funding for the vocational high school program, and motivated and enthusiastic students (Yulfizar, 2023).



**Figure 4. Increased Complexity Using Digital Platforms**

Figure 4 shows that of the 21 Center of Excellence Vocational High Schools (CEVHS) that have received assistance, 18 (86%) provide students with IT training tailored to their areas of expertise. Similarly, 18 CEVHS (86%) introduce students to the digital world, aligning this introduction with their majors. Additionally, 19 CEVHS (90%) offer specialised digital training programs according to the students' majors and reflective of each school's distinct characteristics.

In terms of efficiency and reducing complexity in schools by using digital platforms, schools provide the best attention to digital. This is because digital capabilities can influence the sustainability of a business operating in the national sector. Digital capabilities play an essential role in the world's fast pace. They are improving facilities and infrastructure for student learning practices that meet standards in the world of work.



**Figure 5. Facilities and Infrastructure for Student Learning Practices that are Standard for the World of Work**

Based on Figure 5, it can be seen that the diagram illustrates that among the 21 CEVHS that have received assistance, 19 (90%) have aligned their facilities and infrastructure with real-world internships, ensuring compatibility with post-graduation employment opportunities. Similarly, 19 CEVHS (90%) are upgrading their facilities to meet the business and industrial sectors' demands while providing students with hands-on training in using current tools in the modern workforce. Educational services, on the other hand, are an essential part of the ongoing educational process. Yards, school gardens or parks, roads leading to classrooms, school codes, and other facilities that do not explicitly help the educational or management process are examples of educational infrastructure (Ahmad, 2021).

The school equips the facilities and infrastructure as a real internship by the job after graduation. The school upgrades its facilities and infrastructure to meet business and industrial needs. CEVHS Program assistance has had a tremendous impact on schools, not only on the internal but also on the external side. The school trains students on the use of tools employed in the world of work following the times' demands. Participants' work equipment training has been adapted to today's times.

## **Discussion**

The Centre of Excellence Vocational High School (CEVHS) is a Vocational School development program with specific skill competencies in improving quality and performance, which is strengthened through partnerships and alignment with the business world, the industrial world, and the world of work, which ultimately becomes a reference Vocational School that can function as a driving school and center for quality improvement and other vocational school performance. A mentoring program is designed to help the CEVHS Program achieve output. The mentoring is carried out by universities that have met the criteria.

The effectiveness test results of CEVHS Program mentoring showed extraordinary things before the data was distributed to all school principals. The results of validity tests, data reliability, and data normality were analyzed using spss. The following are the results of the pretest data normality test using SPSS. The normality test results show that the sig is 0.055, which means that the sig is  $>0.05$ , and the data is ready for other tests using SPSS. After the normality test, the effectiveness test is continued.

The t-test is used to test the significant level of the partial influence of the independent variable on the dependent variable. The test is carried out by comparing the t-count with the t-table. Provided that if  $t\text{-count} > t\text{-table}$  and the significant value is  $<0.05$ ,  $\alpha:5\%$ , then the independent variable partially has a significant effect on the dependent variable. Based on the T-test results table, it shows that  $\text{sig } 0.000 < 0.05$ , which shows that the resulting value has experienced very good development. The sig of the data is  $0.000 < 0.05$ , meaning there is a positive relationship between before and after mentoring at CEVHSs. This also shows that the CEVHSs need assistance managing the school and improving its quality. More attention and supervision during the implementation of mentoring is the primary key to changing the management of the Vocational School. Consistency and commitment of all teachers, staff, teachers, and principals are essential to achieving superior schools.

Vocational education is part of a program designed to prepare individual students for gainful employment as semi-skilled or fully skilled workers or technicians who are needed in jobs both for new positions and urgent jobs (Rahmadhani et al., 2022). CEVHS program is an effort to develop vocational schools with specific skills to experience increased quality and performance, which is strengthened through partnerships and alignment with the business and workplace industry (or IDUKA), as well as becoming a reference VHS and centre for improving the quality and performance of other vocational schools. Superior VHSs emphasize their alignment with community needs. In principle, their curriculum implementing the Center of Excellence Program involves the world of work (link and match) into the curriculum. It is based on a new paradigm designed to strengthen student competencies, character, and work culture in line with the Pancasila student profile. The curriculum emphasizes industry collaboration, ensuring students gain real-world experience and develop the necessary skills to thrive in the modern workplace. Additionally, the practical learning experience gained through apprenticeships significantly contributes to the development of student competencies, making them more adaptable and competitive in today's evolving labor market (Barabasch & Keller, 2020).

School management involves systematically administrating educational institutions through planning, organizing, directing, and supervising efforts to achieve predetermined educational objectives. The principal occupies a predetermined position in the school organization as a school manager. The fundamental essence of school management is increasing school autonomy, increasing participation of school residents and the community in implementing education and increasing flexibility in managing school resources (Agustina Muliati et al., 2022). Therefore, the success of school management is primarily determined by the role of the community regulated in the institution, namely the school committee. The school committee operates on the principles of openness, responsibility, and decision-making, which can be taken from the opinions of all parties. The existence of a school committee or school committee gives the community the freedom to provide aspirations in producing decisions regarding the implementation and education programs in schools. The school committee is tasked with driving



the residents' growth, concern, and engagement in providing quality education, encouraging the community and parents to participate and supporting the process of increasing the quality of education and providing equal education, raising community funds for funding sources for educational units. The managerial presence in the institution can help the sustainability of the institution's management system to become more agile and support an effective and efficient learning process that will impact the quality of education (Sudira et al., 2020).

Excellent schools can be realized with good organization and curriculum according to competency standards. The competencies consist of essential competencies and standards developed based on graduation standards. The content of self-development and local activities is a derivative part of the curriculum structure at the primary and secondary levels. Apart from that, some professional teachers can become educators for students. Adequate infrastructure is also an element of a school becoming a superior institution (Sugiyono, 2021). The new paradigm curriculum implementation in vocational high schools, notably the Center of Excellence program, is a characteristic of the core learning activities to produce graduates with competency levels equivalent to their field of expertise. Apart from competency skills as the fulcrum for the quality of vocational school graduates, the profile of student graduates must also be achieved so that vocational school graduates have skills and demonstrate performance in addition to hard and soft skills characterized by the Pancasila spirit.

## CONCLUSION

Learning activities prioritize practice in the vocational school environment. Ideally, the learning process portion in a vocational school environment is 30% theoretical learning and 70% practical to familiarize students with fieldwork activities. This structure is designed to immerse students in fieldwork activities, enhancing their practical skills and readiness for the workforce. Moreover, collaborative efforts foster brotherhood and strengthen people's ties. A robust sense of brotherhood and friendship contributes to a comfortable and peaceful school climate.

The t-test is used to test the significant level of the partial influence of the independent variable on the dependent variable. Based on the T-test results table using SPSS, it shows that sig 0.000 < 0.05, which shows that the resulting value has experienced Very Good development. The sig of the data is 0.000 < 0.05, meaning there is a positive relationship between before and after mentoring at CEVHSs. It showed that CEVHSs need assistance to manage and improve school quality. More attention and supervision during the implementation of mentoring is crucial to changing the management of vocational high schools. Consistency and commitment of all teachers, staff, and principals are badly needed to achieve superior schools.

## REFERENCES

- Abdurrahman, Parmin, & Muryanto, S. (2022). Evaluation of the automotive skill competency test through 'discontinuity' model and the competency test management of vocational education school in Central Java, Indonesia. *Heliyon*, 8(2), e08872. <https://doi.org/10.1016/j.heliyon.2022.e08872>
- Agustina Muliati, Winda Sihotang, Rini Ade Octaviana, & Darwin. (2022). Effectiveness of school resources management in improving the quality of education. *East Asian Journal of Multidisciplinary Research*, 1(6), 901–916. <https://doi.org/10.55927/eajmr.v1i6.480>
- Ahmad, M. (2021). Management of facilities and infrastructure in school. *Akademika*, 10(01), 93–112. <https://doi.org/10.34005/akademika.v10i01.1348>
- Ardian, A., Munadi, S., & Jarwopuspito. (2020). Management analysis of workshop equipment and laboratory in vocational education. *Journal of Physics: Conference Series*, 1446(1). <https://doi.org/10.1088/1742-6596/1446/1/012030>
- Arika, A., Nawir, M. S., Ubaidillah, A., Yusuf, M., & Zulihi, Z. (2023). Strategi implementasi program CoE (Center of Excellence) pada kompetensi keahlian teknik instalasi tenaga listrik. *Cetta: Jurnal Ilmu Pendidikan*, 6(2), 288–305. <https://doi.org/10.37329/cetta.v6i2.2379>
- Arwildayanto, Wiyono, B. B., Rusdinal, Dewi, S., Ashokan, V., Wolok, E., & Said, H. (2023).

- In-service training governance, for elementary school teachers in Indonesia. *Cakrawala Pendidikan*, 42(2), 507–524. <https://doi.org/10.21831/cp.v42i2.56724>
- Bakar, R. (2018). The influence of professional teachers on Padang vocational school students' achievement. *Kasetsart Journal of Social Sciences*, 39(1), 67–72. <https://doi.org/10.1016/j.kjss.2017.12.017>
- Barabasch, A., & Keller, A. (2020). Innovative learning cultures in VET–'I generate my projects.' *Journal of Vocational Education and Training*, 72(4), 536–554. <https://doi.org/10.1080/13636820.2019.1698642>
- Budiningsih, I., As-, U. I., Buana, U. M., Dinarjo, T., & Buana, U. M. (2020). Hard skill versus soft skill dalam pencapaian kinerja karyawan proyek infrastruktur Mass Rapid Transit (MRT ). *Akademika* 9(2), 29–42. <https://doi.org/10.34005/akademika.v9i02.895>
- Dewi, S. S., & Sudira, P. (2018). The contribution of teaching factory program implementation on work readiness of vocational high school students in Makassar. *Journal of Educational Science and Technology (E)*, 4(2), 126–131. <https://doi.org/10.26858/est.v4i2.6434>
- Farizi, A., & Patimah, S. (2023). Effectiveness of human resource management in improving the quality of government higher education Bandar Lampung City. *International Journal of Educational Research & Social Sciences*, 4(4), 605–614. <https://doi.org/10.51601/ijersc.v4i4.669>
- Fatmawati, K. (2024). The dynamics of merdeka curriculum change: Challenges and opportunities in private madrasah ibtidaiyah management. *Mudarrisa: Jurnal Kajian Pendidikan Islam* 16(1), 49–76. <https://doi.org/10.18326/mudarrisa.v16i1.918>
- Gazzard, J. (2011). Developing graduate skills for the United Kingdom's commercial life science sector: Experiences from the ORBIS internship program. *Journal of Commercial Biotechnology*, 17(2), 135–150. <https://doi.org/10.1057/jcb.2011.3>
- Hensiek, S., Dekorver, B. K., Harwood, C. J., Fish, J., O'Shea, K., & Towns, M. (2016). Improving and assessing student hands-on laboratory skills through digital badging. *Journal of Chemical Education*, 93(11), 1847–1854. <https://doi.org/10.1021/acs.jchemed.6b00234>
- Kemendikbud Ristek. (2021). Keputusan menteri pendidikan, kebudayaan, riset dan teknologi Republik Indonesia tentang Program SMK Pusat Keunggulan. *Kemendikbud Ristek*, 73.
- Misra, R. K., & Khurana, K. (2018). Analysis of employability skill gap in information technology professionals. *International Journal of Human Capital and Information Technology Professionals*, 9(3), 53–69. <https://doi.org/10.4018/IJHCITP.2018070104>
- Nurchayono, O. H., Susilawati, Ristanto, S., Khoiri, N., Permendikbud - Nomor 6 Tahun, Menteri Pendidikan, Kebudayaan, R. dan T., Rosnaeni, R., Khoiri, N., Roshayanti, F., Hayat, M. S., Siswanto, J., Roshayanti, F., Widarti, R., Roshayanti, F., Khoiri, N., Rosyayanti, F., Hayat, M. S., Hidayah, N., Hayat, M. S., ... MOELOEK, F. A. (2022). Pergeseran Paradigma Pendidikan Pada Abad Ke-21. *Jurnal Basicedu*, 5(1), 4341–4350. <https://doi.org/10.15294/jpfi.v11i1.4005>
- Raharjo, T. (2020). Efektivitas pendampingan implementasi kurikulum 2013 untuk meningkatkan kemampuan guru melaksanakan pembelajaran. *Indonesian Journal of Educational Development*, 1, 93–103. <https://doi.org/10.5281/zenodo.3760717>
- Rahmadhani, S., Ahyanuardi, & Suryati, L. (2022). Vocational High School Students' Competency Needs to the World of Work. *Mimbar Ilmu*, 27(2), 349–355. <https://doi.org/10.23887/mi.v27i1.42161>
- Rahman, A., Zebua, W. D. A., Satispi, E., & Kusuma, A. A. (2021). Policy formulation in integrating vocational education graduates with the labor market in Indonesia. *Jurnal Studi Pemerintahan*, 12(3). <https://doi.org/10.18196/jgp.123141>
- Roemintoyo, & Budiarto, M. K. (2023). Project-based learning model to support 21st century learning: Case studies in vocational high schools. *Journal of Education Research and Evaluation*, 7(4), 662–670. <https://doi.org/10.23887/jere.v7i4.63806>
- Rosana, D., Jumadi, & Pujiyanto. (2014). Pengembangan soft skills mahasiswa program kelas internasional melalui pembelajaran berbasis konteks untuk meningkatkan kualitas proses dan hasil belajar mekanika. *Jurnal Pendidikan IPA Indonesia*, 3(1), 12–21.

- <https://doi.org/10.15294/jpii.v3i1.2896>
- Rosidah, & Sutirman. (2023). Added value of teaching factory learning in services production unit to prepare graduate work readiness. *Cakrawala Pendidikan*, 42(3), 695–704. <https://doi.org/10.21831/cp.v42i3.49137>
- Sanchez, J. M. (2022). Are basic laboratory skills adequately acquired by undergraduate science students? How control quality methodologies applied to laboratory lessons may help us to find the answer. *Analytical and Bioanalytical Chemistry*, 414(12), 3551–3559. <https://doi.org/10.1007/s00216-022-03992-x>
- Subandi, M. S. (2021). Kesiapan penyelenggaraan program SMK COE pada kompetensi keahlian teknik alat berat. *Jurnal Teknik Mesin Dan Pembelajaran*, 4(2), 97. <https://doi.org/10.17977/um054v4i2p97-108>
- Sudira, P., Santoso, D., Waluyanti, S., & Utami, P. (2020). Model of vocational teachers (Audio video engineering) efforts to support graduates' work readiness. *International Journal of Advanced Science and Technology*, 29(1), 815–827.
- Sugiyono, S. (2021). The evaluation of facilities and infrastructure standards achievement of vocational high school in the Special Region of Yogyakarta. *Jurnal Penelitian Dan Evaluasi Pendidikan*, 25(2), 207–217. <https://doi.org/10.21831/pep.v25i2.46002>
- Sumbodo, W., Yudiono, H., Salim, & Setiadi, R. (2019). The role of industry partners to improving student competency of vocational high school. *Journal of Physics: Conference Series*, 1387(1). <https://doi.org/10.1088/1742-6596/1387/1/012031>
- Susatya, E., Triatmaja, A. K., Suratno, E., & Faisyal Fachri, F. (2023). Impact of the center of excellence vocational high school program on the interest of new learners. *Journal of Vocational Education Studies*, 6(1), 62–75. <https://doi.org/10.12928/joves.v6i1.7256>
- Yulfizar, S. (2023). The influence of school-based management on the quality of education in private vocational high schools and its impact on employment competitiveness. *International Journal of Ethno-Sciences and Education Research*, 3(1), 7–13.