



THE IMPLEMENTATION OF INDUSTRIAL WORK CULTURE IN VOCATIONAL EDUCATION AS AN EFFORT TO ENHANCE PRACTICAL COMPETENCE AND STUDENT READINESS TO ENTER THE INDUSTRIAL WORLD : SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

Technical and Vocational Education and Training (TVET) plays a role in preparing a competent and adaptive workforce in the era of globalization. However, the graduates produced have not fully met the qualifications of the workforce as required by the industrial world, therefore one of the strategies in order to improve the quality of graduates is to instill an industrial work culture in the education process to improve their skills so as to increase their competitiveness. This study aims to systematically examine the application of industrial work culture in vocational education as a strategy to improve practical competence and readiness of students to enter the world of work. Through a systematic literature review approach, this study examines both national and international literature relevant to the integration of industrial work culture values with the Vocational High School (SMK) environment. Based on the results of the literature review, industrial work culture has several elements such as the application of 5R/5S (Ringkas, Rapi, Resik, Rawat and Rajin), discipline, responsibility, cooperation (teamwork) can make a positive contribution to strengthening students' character and technical skills. In addition, internship programs also provide contextualized learning experiences that strengthen graduates' work readiness. These findings emphasize the importance of collaboration between educational institutions, industry, and policy makers in designing learning strategies based on industrial work culture to produce vocational graduates who are adaptive and competent amid the dynamic needs of the global industry.

Keywords: Industrial Work Culture, Vocational Education, 5R/5S, Practical Competence, Systematic Literature Review

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1. INTRODUCTION

Along with the times, technological developments have penetrated almost all aspects of life, including in the field of education. In developing countries such as Indonesia, vocational education has a role in economic and social development (Ningsih et al., 2024). The term vocational or vocational education has various terms in various countries. Internationally, this concept is known as Technical and Vocational Education and Training (TVET), where there are education and training activities in formal, non-formal, and informal channels (Irwanto, 2024). One level of formal education in Indonesia that has a strategic role in preparing a skilled and ready-to-use workforce is secondary vocational education, which is realized through the existence of Vocational High Schools (SMK). SMK not only focuses on mastering theoretical aspects, but also emphasizes the development of practical skills that are relevant and applicable in the industrial world (Radjak et al., 2025). Vocational High Schools (SMK) aim to prepare students to have work readiness in certain fields of expertise. In this context, SMK plays a strategic role in providing skilled labor, considering that the business world and the industrial world require professionally educated and trained human resources. However, until now the graduates produced have not been able to fully meet the labor qualifications required by the industry (Mujayaroh, 2021). In addition to the limitations of industry-oriented education facilities, the low readiness of graduates in terms of soft skills, knowledge, work skills, and understanding of industrial culture causes a mismatch between the field of expertise and the work undertaken (Sudarsono et al., 2023).

Several member countries of the Organization for Economic Cooperation and Development (OECD) have demonstrated success in transforming and advancing industry-based vocational education. This success is reflected in: (1) the openness of industry partners

in providing opportunities for students to engage in workplace internships; (2) the active role of governments in facilitating and ensuring strategic industry involvement to support the sustainability of learning in vocational schools; and (3) the ongoing contributions of research institutions in examining partnerships between industry and vocational schools (Haviland et al., 2021). Therefore, concrete collaboration between schools and industry is essential to produce high quality graduates. Another strategy to improve graduate quality is to instill a strong work culture through the educational process (Wulandhari & Mufidah, 2024). Work culture is a set of dominant values adopted in an organization and socialized thoroughly, which plays a role in improving work efficiency and strengthening collaboration between organizational members (Indriani et al., 2019). Industrial work culture is basic knowledge that needs to be understood by individuals involved in the industry because it has the main purpose of supporting the implementation of company operations by encouraging changes in the attitudes and behavior of human resources (HR). This transformation is expected to improve organizational performance as well as an important strategy in responding to various business challenges in the future. Industrial work culture values and principles begin to be integrated into the learning process for vocational students (Mujiburrohman et al., 2025). The implementation of work culture in the SMK environment has an important role as an initial foundation for students in preparing themselves to enter the industrial world and the world of work in general. The implementation of industrial work culture values also contributes to the formation of soft skills that are essential for students' career success. In general, the purpose of integrating work culture in SMK is to equip students with a work ethic that is in line with the demands of the world of work and improve adaptability to the dynamics of the professional work environment. With this, it is hoped that

familiarizing industrial culture in schools can have an impact such as getting used to following and adjusting to the culture in the industry and not being awkward or confused when later entering the world of work or the industrial world.

SMK students are individuals who need mastery of applied knowledge that is relevant to the needs of the industrial world. The higher the level of conformity between learning materials at school and the competencies needed by industry, the greater the readiness of students to enter the world of work. This also has an impact on reducing the need for industry to provide additional training to graduates who are recruited as new workers. To achieve these objectives, this study was conducted through a systematic literature review of relevant research on the implementation of industrial work culture in the context of secondary vocational education. The findings of this study are expected to contribute to the development of vocational education in Indonesia, especially in preparing graduates who have competencies that are aligned with the needs of the business and industrial world (DUDI) or the world of work.

2. METHODS

The method used in this research study is *Systematic Literature Review* (SLR). This method provides a systematic and transparent framework for researchers to identify, critically evaluate, and synthesize findings from previous studies relevant to a particular topic (Barricelli, et al., 2019). This method is used because it allows researchers to identify, evaluate and synthesize research relevant to topics related to industrial work culture that can be applied in SMK to support students' readiness for the world of work (business world and industrial world). The research process is carried out systematically to find, critically examine, integrate so as to obtain the results of various research studies and in accordance with the research topic. The stages carried out in the systematic literature review

process include identifying research questions, conducting literature searches in several databases, determining inclusion and exclusion criteria, assessing the level of relevance and quality of the selected studies, extracting relevant data, synthesizing data with meta-analysis or thematic analysis, then the results of the review data are presented in the form of tables and paragraphs.

This method is done by searching for data which is then processed and collected using Publish or Perish software with several sources including Google Scholar, Semantic Scholar, DOAJ and Garuda. The article search period starts from 2020 to 2025. To achieve the research objectives, the research questions are as follows: RQ1 : What kind of industrial work culture can be effectively implemented in SMK to support students' skills and readiness to enter the industrial world or the world of work?

The following is a table of inclusion and exclusion criteria, among others:

Table. 1 Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion
Type of Publication	Indexed articles (accredited)	In addition to indexed (accredited) articles
Research Topic	Research related to industrial work culture	Research other than those specified
Research methodology	Quantitative, Qualitative, Mix Method, SLR.	In addition to the predetermined methods
Publication Period	2020 to 2025	Beyond 2020 to 2025

Below are the steps in the systematic literature review process, which are as follows:

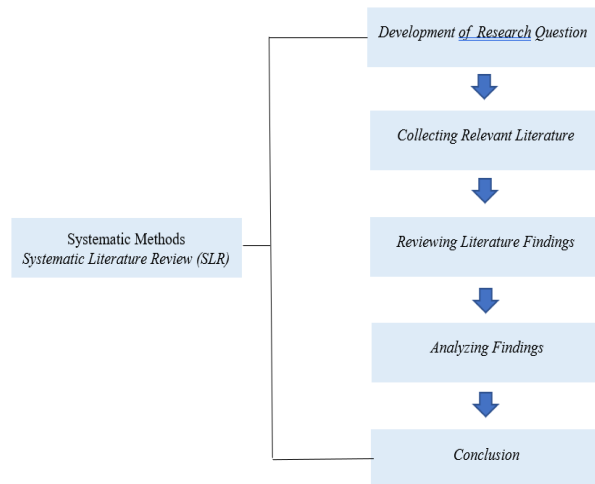


Figure. 1 Systematic Review Steps

3. FINDINGS AND DISCUSSION

Findings

Based on the results of data searches using the Systematic Literature Review (SLR) method, 172 journals were found related to industrial work culture that can be applied in vocational schools. The process of searching for scientific articles was carried out by utilizing the Publish or Perish application using the keywords “industrial work culture” and “Vocational High School”. From the search results, a total of 12 articles or journals were considered relevant for further analysis. After ensuring the quality of the journals, the analysis stage continued with the data extraction stage. This stage is carried out by analyzing information based on the title, author's name and findings grouped systematically. The results of the search for articles that have been selected and have been described in the table below, among others:

Table. 2 Data Extraction Results

No.	Author and Year	Title of Research	Finding Results
1.	(Wahyudi et al., 2024) , 2024	Improving Teachers' Understanding of Applying Industrial Work Culture to Learning in Vocational Schools.	The application of industrial work culture is carried out through the 5R method approach (Rapi, Ringkas, Resik, Rawat and Rajin), the application of Kaizen principles, and the integration of knowledge related to soft skills needed in the industrial world.
2.	(Sudarsono et al., 2023)	Industry-Based Training as an Effort to Improve Understanding of Industrial Work Culture of Students of SMK Muhammadiyah 2 Tempel	Industrial work culture consists of four main components, namely skills, knowledge, understanding, and personality attributes, which collectively form an individual's readiness to face the demands of the world of work. In addition, industrial work culture also includes important elements such as responsibility, flexibility, communication skills, self-perception, and awareness of occupational health and safety aspects.

3.	(Sholeh et al., 2023)	Introduction of 5R Industrial Work Culture Concept for Students SMK Taruna Bhakti	An industrial work culture that adopts the 5R principles of Ringkas, Rapi, Resik, Rawat, and Rajin is a systematic approach designed to optimize operational efficiency and increase productivity in an industrial work environment.
4.	(Mujayaro, 2021)	Group Guidance Model Based on Industrial Work Culture to Improve Students' Career Maturity	The actualization of a productive work culture represents a value system that includes an understanding of the meaning of work, attitude towards work, work behavior, work ethic, time discipline, and work implementation methods. The stronger the internalization of these positive values in individuals, the greater the tendency to increase the performance shown.
5.	(Sakdiah et al., 2023)	Socialization of Industrial Work Culture as an Effort to Strengthen Basic Competencies of Students of SMK Negeri 7 Lhokseumawe	One form of work culture that can be adapted in the vocational education environment is the 5R concept, which consists of concise, neat, clean, maintain, and diligent. The implementation of the 5R culture has the potential to have a positive impact on increasing productivity, work quality, operational efficiency, discipline, individual and collective responsibility, work safety, work environment comfort, and the formation of a professional image.
6.	(Myrtanti et al., 2022)	Implementation of 5S Work Culture in the Plastic Shredding Industry CV. Rabbani	The implementation of a work culture that refers to the 5S principles (Seiri, Seiton, Seiso, Seiketsu, and Shitsuke) is carried out by thoroughly considering all elements in the work system, including human factors, equipment or machinery, and work environment conditions.
7.	(Basuki et al., 2023)	Industrial Work Culture Training through Guest Teacher Program as Internship Preparation for Students of SMKN 1 Semarang	Internships provide an opportunity for participants to participate directly in the company's operations, including interacting and collaborating with employees for a predetermined period
8.	(Widianto et al., 2021)	The Effect of Work Motivation, Work Environment and Work Culture on Employee Performance	Work culture is understood as an integration of values, belief systems, communication patterns, and behaviors that are collectively formed and systematized to provide direction and guidance in social life. This basic concept

			of culture develops through a process of shared learning that is based on managing and allocating resources appropriately and efficiently.
9.	(Hafidz et al., 2025)	Training on Occupational Safety and Health (K3) and Industrial Culture in Vocational Schools	One form of industrial work culture that can be adapted in the Vocational High School (SMK) environment is through the application of Occupational Safety and Health (K3) principles, which include the implementation of work safety procedures and the consistent use of personal protective equipment (PPE).
10.	(Herawati et al., 2025)	Education on Mental Readiness and Work Culture in the Oil and Gas Industry for Students of SMK Migas BMR Pekanbaru	Industrial work culture that can be implemented in Vocational High Schools (SMK) includes aspects of education and training that focus on developing mental readiness and internalizing work culture values.
11.	(Rochayati & Wardani, 2020)	Work Character Learning Model in Vocational High School	The work character learning model is developed by involving the business and industrial world (DUDI) as a strategic partner of the school in the implementation of the learning process. The implementation of the model is carried out through routine activities that present representatives from DUDI to provide an understanding of work culture in a professional environment to SMK students. Work character indicators that are the focus of development in students include discipline, loyalty, high work ethic, responsibility, professionalism, honesty, tolerance, leadership, ability to work in teams, adaptability, creativity, innovation, and skills in problem solving.
12.	(Yoto et al., 2024)	The Role of Industry to Unlock the Potential of the Merdeka Curriculum for Vocational School	This study highlights the importance of industry involvement in the implementation of Merdeka Curriculum in SMK, from curriculum alignment, 5S work culture inculcation, to implementation evaluation. The study found that collaboration between SMK and industry is complex but crucial in ensuring the suitability of graduates' competencies with the needs of the

			world of work, as well as strengthening students' character and work quality through a collaborative and transformative process.
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Table. 2 shows that the industrial work culture that has been applied in previous studies is carried out through various forms, namely by applying the 5S or 5R principles, including Ringkas, Rawat, Rapi, Resik and Rajin. With this approach, it is designed, to increase productivity and optimize work operational efficiency in the work environment or industry. In addition to the understanding and application of industrial work culture, discipline, work behavior, work ethic, and work execution also influence to increase individual work productivity. The application of other methods such as occupational safety and health (K3) aims to create a safe and healthy work environment, so as to reduce potential losses and support the achievement of company productivity and profitability goals in a sustainable manner. OHS is also a systematic effort aimed at creating a work environment that is safe, healthy, and free from various forms of environmental pollution. And the indicators of this K3 include the condition of the work environment, work equipment, physical conditions of workers and the use of PPE. In addition, through internship activities, individuals can directly participate and learn the industrial work culture firsthand.

Discussion

Vocational education emphasizes programs to develop competencies needed by the world of work and society, compared to general competencies, this approach is expected to minimize the risk of unemployment in the future by preparing graduates who are in accordance with the demands of the labor market (Hoidn & Št'astný, 2021). As a vocational education institution, Vocational High School (SMK) acts as an educational institution that has the responsibility of shaping character, attitudes,

skills, and instilling positive values in order to prepare competent and productive human resources in the world of work (Dardiri et al., 2020). A number of member countries of the Organization for Economic Co-operation and Development (OECD) have successfully transformed and developed vocational education based on industry needs. This success is reflected in several key indicators, namely: 1) the openness of the industry in providing opportunities for students to carry out field work practices, 2) the active involvement of the government in facilitating and ensuring industry participation in supporting the sustainability of the learning process in vocational education units, and 3) the role of research institutions that continuously conduct in-depth studies on the form and effectiveness of collaboration between vocational education institutions and the industrial sector (Haviland et al., 2021).

Work culture in an industrial environment as a whole includes several main related aspects, including: 1) Skills, which are abilities required to carry out various tasks that can be developed in line with industry dynamics and can be obtained through training and work experience; 2) Knowledge, emphasizing the importance of formal education as a theoretical foundation to support mastery of certain areas of expertise; 3) Individual capacity to interpret and internalize information that has been obtained, so as to be able to carry out work effectively, achieve job satisfaction, and realize personal goals; and 4) Personality, reflecting individual characteristics that play an important role in encouraging the development and optimization of self-potential in a professional context (Sudarsono et al., 2023). Experts have also identified some important aspects of industrial work culture namely: 1) Responsibility, workers have responsibilities such as showing up on time and completing tasks

properly; 2) Flexibility, workers are able to adapt to changes in the work environment; 3) Skills, individuals are ready to work and able to apply their knowledge in various work situations; 4) Communication, where individuals have good communication skills and can be applied in the workplace; and 5) Awareness and self-view of the importance of Occupational Safety and Health (K3) (Wahyudi et al., 2024).

One of the efforts in order to improve the quality of individuals or graduates as preparation for entering the world of work is one of applying the 5R or 5S concept. The practice of 5S work culture has been effectively implemented by a number of leading companies in Japan, such as Toyota, Honda, and Hitachi (Pasolon et al., 2024). The 5S concept originated in Japan as a framework of principles and practices to improve efficiency and order in the workplace. The methodology of organizing and maintaining the work environment in Japanese is known as 5S where each element begins with the letter “S”. In the Indonesian concept, the principles in 5R are Ringkas, Rapi, Resik, Rawat and Rajin, which are concepts that have the aim of creating a clean work environment to increase productivity, efficiency in the industrial work environment (Sholeh et al., 2023). In Japanese, 5S means Seiri, Seiton, Seiso, Seiketsu, Shitsuke (Mu’adzah et al., 2020). In English, 5S is described as Short, Set in Order, Shine, Standardize, and Sustain. (Yoto et al., 2024).

Below is a table of the 5S concept in Japanese, Indonesian and English terms:

Table. 3 5S/5R Concept

No.	Terms in Indonesian	Terms in Japanese	Terms in English
1.	Ringkas	Seiri	Short
2.	Rapi	Seiton	Set in Order
3.	Resik	Seiso	Shine
4.	Rawat	Seiketsu	Standardize
5.	Rajin	Shitsuke	Sustain

Seiri or short is a process that focuses on eliminating or sorting unnecessary items in the work environment (Restuputri & Wahyudin, 2019). This activity aims to eliminate unnecessary items so that all items at the work site are only items that are needed in the implementation of work activities. This process involves the selection and removal of items, documents, files or equipment that are no longer in use, leaving only those that are absolutely essential for operational activities. The implementation of the seiri stage aims to improve the efficiency of storage space by utilizing the area to store only relevant and essential items. In addition, this step also contributes to the creation of a more organized work environment.

Seiton or set in order refers to the process of arranging work equipment in a systematic and organized manner to minimize search time, so that each tool can be found quickly and efficiently. After the sorting stage is carried out on items or documents that are no longer used, all equipment must be placed in a predetermined position so that it is always ready to be used when needed. The activity of tidying up equipment or something that must be placed in a predetermined position and place so that it is ready to be used when needed. The application of the Seiton principle is shown through the arrangement of goods and equipment arranged in a neatly organized manner. The implementation of this principle through the management of cleanliness and the systematic arrangement of work facilities contributes to creating a more organized, safe, and efficient work environment (Pasolon et al., 2024). The application of the seiton principle through the management of cleanliness and the systematic arrangement of work facilities contributes to creating a more organized, safe, and efficient work environment.

Seiso or also known as shine is an activity that includes cleaning the work area, maintaining cleanliness on a regular basis, and using cleaning tools as part of an inspection of the workplace and equipment that may be damaged or defective

(Marfuah et al., 2024). Maintenance activities include cleaning equipment and work areas to ensure that all work equipment is in optimal condition. It is important to instill the awareness that cleanliness is a crucial aspect of daily life. Ignorance of cleanliness can lead to environmental pollution, which in turn is a major factor in the spread of various diseases and a decrease in living comfort. This condition has a negative impact on productivity levels and has the potential to cause various losses. Therefore, routine efforts are needed in the form of daily cleaning activities, hygiene evaluation, and ongoing maintenance of cleanliness.

Seiketsu or standardize or often called standardization. At this stage, each individual is expected to have a clear understanding of their responsibilities in maintaining the previous three aspects. Seiketsu (maintenance) is understood as the standardization process of the sorting, organizing, and cleaning stages, which reflects a commitment to continuous awareness and regular actions to ensure the implementation of the 5S principles is maintained (Badiah & Sukarsno, 2025). The implementation of the Seiketsu principle is done by expanding the concept of cleanliness not only to the work environment, but also to personal hygiene, and consistently practicing the previous three steps in the 5S method. The next step is to maintain the conditions that have been achieved in accordance with the standards set. Standardization of the workplace is carried out through the establishment of regulations aimed at fostering employee discipline in the production line, including the preparation of a rotating 5S implementation supervision schedule. In addition, visual media in the form of posters have been installed in strategic areas that are easily visible to employees, as a reminder of the importance of the 5S program, so that it is hoped that all employees can continue to comply and make a habit of implementing 5S in their daily work activities. Therefore, the organization developed procedures, rules, and standard expectations to ensure the continuity of activities

in all areas on a rotating basis (Mu'adzah et al., 2020).

Shitsuke or sustain refers to a habituation process where a condition of the previous four principles has been implemented consistently and internalized as part of the work culture. The term Shitsuke in the context of Japanese work culture refers to the ability of individuals to carry out tasks consistently in accordance with established standards. This concept plays a role in encouraging positive behavior among employees, as well as forming sustainable work discipline. This fifth element of the 5S principle is crucial, as it emphasizes the importance of proactive behavioral change at all levels of the organization (Kobayashi, et al., 2008). The shitsuke principle is implemented as an effort to encourage workers to consistently participate in maintenance and continuous improvement activities, as well as forming habits of compliance with the rules that apply in the work environment. As an example of the application of the shitsuke principle in the tool storage area, regular condition checks are carried out every week, including checking the orderliness of the arrangement of tools and the cleanliness of the storage environment.

The forms of 5S industrial work culture that can be applied at the SMK level are as follows:

Table. 4 Application of 5S Industrial Work Culture in Vocational Schools

No.	Industry Work Culture	Implementation
1.	Seiri	a. Maintenance of tools in the workshop. b. Take and use tools according to the job in accordance with the Standard Operational Procedure (SOP).
2.	Seiton	a. Placement of workshop or practical equipment in strategic positions to minimize unproductive time and

		movement during the practical process. b. Organize the tools according to their place.
3.	Seiso	a. Maintain neatness in the work environment. b. After using the equipment, cleaning is done.
4.	Seiketsu	a. Keep machinery or equipment in top condition. b. Periodic maintenance.
5.	Shitsuke	a. Implementation of a concise work culture. b. Implementation of a clean work culture.

The implementation of the 5S/5R concept allows students to create a more organized, clean and efficient learning environment. These conducive environmental conditions contribute to increased student focus on academic tasks, thus positively impacting their productivity and learning outcomes. By building a strong work ethic foundation, students are expected to develop positive work habits and culture in their daily lives. This will prepare them optimally when entering the world of work in the business and industrial world (DU/DI) after graduation. The method itself is a systematic approach to organizing and managing work areas in a sustainable manner to achieve improvements in the quality of the work environment. Through systematic planning, management, and organization of production processes, the application of 5S principles contributes to increased operational efficiency, workspace savings, more optimal use of capital, and shorter production times. In addition, this approach also has an impact on improving output quality by reducing product defect rates, while creating a disciplined, clean, and organized work environment (Shahriar et al., 2022).

In addition, SMK as a vocational education institution students are required or obliged to have a high work ethic. Therefore, the implementation of the 5R culture is very important. In the school context, the 5Rs concept is implemented to ensure that the learning environment as well as the arrangement of practical tools are neat, clean and well-maintained. This aims to improve the efficiency of the learning process while creating comfort for students. In addition, the implementation of work culture also plays a role in minimizing the risk of hazards during practical activities. The implementation of the 5R culture (Resik, Ringkas, Rapi, Rawat, Rajin) among students provides various significant benefits in improving the work ethic and skills of students in the school environment. This culture specifically instills discipline and habits in maintaining cleanliness and tidiness, which contributes to improved work efficiency and orderliness. Students who are accustomed to implementing the 5Rs culture show a tendency to be more thorough and systematic in carrying out tasks, potentially improving their performance and the quality of their work. Therefore, students are better able to prepare themselves to enter the world of work or industry after graduating from SMK.

4.CONCLUSION AND SUGGESTION

Based on the results of the research, the application of industrial work culture in vocational education has proven to have a strategic role in shaping students' practical competencies and improving their readiness to enter the world of work. Key elements in industrial work culture, such as discipline, responsibility, collaboration, and the application of the 5R/5S principle (Ringkas, Rapi, Resik, Rawat, Rajin), are able to build a work ethic that is relevant to the demands of modern industry. In addition, structured industrial internship activities and direct partnerships with the business world and the industrial world (DUDI) provide contextual experiences that strengthen

students' technical skills as well as soft skills. Therefore, the integration of industrial work culture in the curriculum and learning activities in SMK is not only a necessity, but a necessity to prepare graduates who are adaptive, competent, and ready to work.

A joint commitment is needed between vocational education institutions, the industrial world, and the government in developing a comprehensive and sustainable industrial work culture implementation strategy. Schools need to adopt a more holistic approach in instilling work culture values from an early age, including through the habituation of the 5R/5S principles in the school environment and strengthening immersive internship programs. Teachers and instructors also need to be trained to become effective facilitators of industrial work culture. In addition, periodic evaluations of the effectiveness of industrial work culture implementation need to be conducted to ensure that the learning process actually produces graduates who have high competitiveness in the global labor market.

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