

Implementation of e-commerce in improving the competitiveness of vocational secondary education student entrepreneurship products

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ABSTRACT

This study aimed to identify problems, describe, analyze, and evaluate the use of e-commerce to increase the competitiveness of innovative and entrepreneurial products produced by students of State Vocational High School 3 South Tangerang, Banten Province, Indonesia. This research had three main stages, namely the preparation stage, the implementation stage, and the evaluation stage. The research location was the State Vocational High School 3 South Tangerang, Banten Province, Indonesia, due to the school being outstanding in the field of Motorcycle and Animation expertise. The resource persons and respondents in this study were teaching teachers and students in classes 10-12 majoring in culinary, automotive, and animation. Implementing e-commerce activities at the production unit of State Vocational High School 3 South Tangerang, has increased the image of the production unit of State Vocational High School 3 South Tangerang. This study was a descriptive qualitative with the questionnaire, interview, and practice method. This study revealed that the application of e-commerce using the Shopee seller marketplace provided significant benefits and impacts for the production unit of State Vocational High School 3 South Tangerang. When the production unit implemented e-commerce, sales turnover increases rapidly, and the number of consumers, as a means of promotion, ease of transaction did not need to meet directly with buyers and can expand the business. However, there were also several obstacles, like weak human resources, intense competition, and the emergence of plagiarism of ideas and products.

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1. INTRODUCTION

Based on Government Regulation No. 29 of 1990, vocational high school/sekolah menengah kejuruan (SMK) can develop a professionally managed and profit-oriented production unit. With the production unit's permission in SMK to produce goods that can be sold to the community, the production unit SMK can be one of the sources of income to support the school's operational activities [1]. In its implementation, the main obstacles faced are capital and marketing of the results of the production unit. According to the results of research by Wahjusaputri *et al.* human resources are learners, and teachers become obstacles for business actors in the management and development of their business due to a lack of

knowledge, motivation, and skills to adopt new technological developments to improve product competitiveness [2].

The e-commerce system uses computer networks to carry out business communications and commercial transactions, including transaction components (buyers, sellers, goods, services, and information), subjects, and objects involved. Moreover, the media used (the internet) [3]. Creating marketing facilities for innovative products and student entrepreneurship requires internet-based media to connect student talent for the student sales process, namely e-commerce. E-commerce is one of the means to support sales process problems that are still limited in time and service quality for students to interact with consumers. Research conducted by Wahjusaputri *et al.* explains that limited human resources are an obstacle for business actors in managing and developing their business, such as it is challenging to adopt new technological developments to increase the competitiveness of the products produced. Buyers will not want to go directly to the school to buy a product [4].

Moreover, the distance is also impossible to go to State Vocational High School 3 South Tangerang, Banten Province, Indonesia. Students become easier to develop their business without spending time, effort, and thought to managing the process of selling their handicrafts [5]. The school itself will also not occupy the time to monitor manual sales transactions that take a long time and are inefficient because school assignments are also too busy to guide their students [6].

The role of e-commerce in supporting the promotion process for products and services in students of the culinary art study program of State Vocational High School 4 Banjarmasin, Indonesia. Based on the study results, it was seen that students' enthusiasm was relatively high. Their interests and talents are quite capable, and they just need to be honed and developed. Supporting facilities and infrastructure are pretty good, such as Wifi Internet available, a fully equipped laboratory with an adequate number of units. Teaching information technology (IT) and marketing management staff, especially online-based promotions for goods and services, already exist, especially to empower teachers in the recognition of prior learning (RPL) study program, to apply good marketing management with promotional techniques using digital online/e-commerce [7].

The application of e-commerce in SMK is still very minimal. Lahtinen *et al.* conducted research related to the motivation for applying e-commerce in increasing the entrepreneurial interest of students at State Vocational High School 6 Tanjung Balai, Indonesia. From the research, the students gain knowledge about technopreneurship. Apart from that, students are also motivated to become business beginners using their own business and want to combine marketing knowledge with information technology using e-commerce when taking college levels [8].

E-commerce web training to promote featured products at State Vocational High School 4 Pekanbaru, Indonesia. This study found that students and teachers were very enthusiastic about learning the e-commerce web and could promote innovative products at State vocational high school 4 Pekanbaru. However, there is a need for continuous coaching from the training carried out to maximize the benefits of implementing web-based e-commerce [9].

A strength, weakness, opportunities, threats (SWOT) analysis was carried out to deepen the identification of problems in this study. The SWOT analysis method is a methodology that surveys external opportunities and threats and their relationship to the company's internal strengths and weaknesses. SWOT analysis is used to evaluate the company's resources' strengths and weaknesses, as well as external opportunities and challenges [10]. The SWOT analysis for production unit State Vocational High School 3 South Tangerang, Indonesia can be seen in Table 1.

Table 1. SWOT analysis

Element	Analysis
Strenghts	The strength of State Vocational High School 3 South Tangerang is that it has services, namely weddings, gatherings, and other official and informal occasions, that require documentation services, logo design services, or banners and banners that prioritize quality and models following trends. In addition, SMK 3 has a workshop to provide vehicle repair services; competitive prices and able to compete.
Opportunity	Having a wide market share, domestically and abroad and the rapid development of information technology supports various aspects of the production unit of State Vocational High School 3 South Tangerang.
Weakness	The use of the website as a medium of information does not yet exist. Recording reporting transactions is not yet fully computerized, allowing data loss to occur. Have not used any marketplace or social media to make sales and marketing.
Threats	Many similar businesses in State Vocational High School 3 South Tangerang and surrounding areas have lower prices, so an effective strategy is needed to compete.

Based on the SWOT analysis and previous research, this study aims to identify problems, describe, analyze and evaluate the use of e-commerce to increase the competitiveness of innovative and entrepreneurial products produced by students of State Vocational High School 3 South Tangerang, Banten Province,

Indonesia. Because of the rapid advancement of technology and information, vocational students must get familiar with the internet and maintain constant access to it [11], [12]. One of the new lifestyles is shopping via the internet, often called e-commerce. The use of e-commerce is carried out by large companies and the world of education, especially SMK in entrepreneurship [13]. The existence of creative products and entrepreneurship subjects can be implemented into a production business unit that produces various kinds of goods or services that can be sold to the public according to the categories and abilities of SMK students [14]. The activities of business units through creative products and entrepreneurship at State Vocational High School 3 South Tangerang, Banten Province experienced many obstacles. The main obstacles came from the capital and marketing side. To overcome these obstacles, one solution that can be done is to use e-commerce to increase the competitiveness of students' innovative products [15]. This solution is considered appropriate because students are now familiar with smartphones, and almost all of them already have them. It only takes the creativity of vocational students to utilize existing e-commerce applications. Because to use e-commerce applications, such as Lazada or Bukalapak, and Shopee, students only need to have a smartphone and a data package. The rest students can do marketing anytime and anywhere [16].

The research location of the SMK that will be studied is State Vocational High School 3 South Tangerang, Banten Province, Indonesia because the school is outstanding and has an advantage (center of excellence) in the field of motorcycle and animation expertise. This research has three main stages (the preparation, implementation, and evaluation stages). The development of e-commerce, which is integrated with creative products subjects in vocational schools, is expected to be one of the media that can develop students' entrepreneurial spirit. The vocational school platform as a Business Creating School/Sekolah Pencetak Usaha can be realized and implemented as expected.

2. RESEARCH METHOD

Based on these problems, efforts to obtain identification and analysis needs following the needs of the application of e-commerce to increase the competitiveness of innovative and entrepreneurial products elicit the needs of students. This research is qualitative descriptive research through three stages: the preparation, implementation, and evaluation stages. The descriptive method, according to Creswell, is a method for describing or analyzing a research outcome but not for drawing broad generalizations [17]. In addition, qualitative descriptive research does not provide, treat, or change the variables studied, describing an existing condition [18]. The only treatment given was the study itself, which was carried out through observation, interviews, and documentation [17].

2.1. Preparation stage

The preparation stage was carried out, starting with a literature study and interviews to identify problems related to the implementation of e-commerce in the production unit of State Vocational High School 3 South Tangerang [19]. The activities carried out at this stage are the meeting with the person in charge of the service participants, namely the Head of State Vocational High School 3 South Tangerang, explained the motivation for implementing e-commerce in increasing the competitiveness of innovative and entrepreneurial products for State Vocational High School 3 South Tangerang students in the industrial revolution era 4 related to the team's vision and mission in implementing the three pillars (*Tri Dharma*) of higher education. The meeting was held online due to the COVID-19 pandemic.

Then, interviewees in this study were the principal, the teaching factory teacher, and the production unit head at State Vocational High School 3 South Tangerang. The interview points awarded to the interviewees are: i) What sales methods does the production unit currently use?; ii) How does the production unit carry out promotions to increase product sales?; iii) Is there an increase in profits and sales every month?; iv) Is there an increase in the number of consumers every month?; v) What are the obstacles that the production unit experiencing with the current sales method? At this meeting, coordination was also carried out with the school regarding the target participants, participant requirements, and the schedule for socialization.

2.2. Implementation stage

Implementation is an application or action taken based on a plan that has been prepared or made carefully and in detail beforehand. Another opinion says that the notion of implementation is an action or a form of real action in carrying out a carefully designed plan. In this stage, there are three steps taken: taking photos or product documentation, editing photos or documents and creating a Shopee account, conducting webinars, and creating modules on social media and e-commerce.

2.2.1. Taking photos or product documentation

The implementation of e-commerce begins with taking pictures or documentation on the product of the State Vocational High School 3 South Tangerang production unit. This step aims to ensure that the content generated on the e-commerce account is more attractive to consumers and neatly organized [20]. The documentation taken includes workshops and some sample products.

2.2.2. Editing photos or documents and creating a Shopee account

Editing of images or documentation is done so that the resulting images can become a good quality catalog. The editing software used is Adobe Photoshop CC 2015. During the COVID-19 pandemic, everyone is required to stay at home [19]. With marketing through a marketplace in buying and selling online to make it easier for sellers and buyers to make transactions online, the public or consumers don't have to leave the house to transact or buy products, just transact online, this research activity has produced a market place, namely Shopee [21].

2.2.3. Conduct webinars and create modules on social media and e-commerce

A webinar is a seminar conducted through a website or certain internet-based application. This technique itself allows speakers or presenters to share their information via the internet or other electronic media. This webinar explains the definition of e-commerce, a brief explanation of Shopee, and the features that Shopee sellers can utilize. In addition, the researcher also explained the strategy to make the store more attractive and organized, both in terms of visualization and writing [22].

2.3. Evaluation stage

The evaluation stage is related to implementing e-commerce in the production unit of State Vocational High School 3 South Tangerang. This evaluation was carried out in a qualitative-descriptive manner using a questionnaire. The following are the points of the questionnaire submitted to the respondents: i) E-commerce helps the production unit in increasing the exchange of information with consumers; ii) E-commerce helps me to provide better service to consumers; iii) E-commerce helps me to expand my business reach; iv) E-commerce helps me to reduce promotion costs; v) E-commerce gives my business a strong position in the competition; vi) E-commerce can attract investors to invest in my business; vii) Production unit's income increases by using e-commerce; viii) In selling products using e-commerce, there are no difficulties or obstacles; ix) E-commerce helps increase consumer loyalty to the production unit; x) There is an increase in the number and diversity of consumers.

The evaluation was carried out to measure and provide an objective value for achieving the results of the implementation of the questionnaire distribution [23]. Evaluation always seeks to question the effectiveness and efficiency of the implementation of a plan which at the same time measures the objectives of e-commerce implementation with acceptable measures for those who support or do not support a plan, as well as to assess the success of the implementation of a program/activity [24]. E-commerce is based on indicators and performance targets that have been set. First, the preparation stage where SMK must prepare infrastructure as a medium of information and communication with the availability of the internet. The internet is the primary medium in marketing transactions for students' innovative products. In addition to communication equipment that must be prepared is students' knowledge of e-commerce technology.

Second, suppose the preparations have been fulfilled. In that case, the implementation of e-commerce positively impacts the marketing and promotion of students' innovative products, namely: i) It can increase the market exposure (market share) of the creative products of SMK. Online transactions make it possible for everyone to order and buy products that are sold only through computer media and are not limited by distance and time; ii) Lowering the operating costs of SMK. E-commerce transactions are transactions in that most operations are programmed in a computer, such as promotion costs, transportation, and product production costs; iii) Widen the reach (global reach). Everyone in the globe has access to online transactions, which are not limited by location or time because they can only be accessed through computer intermediary medium; iv) Increase customer loyalty. This is because the e-commerce transaction system provides complete information and this information can be accessed at any time [25]. In addition, consumers can even choose the product they want in terms of purchases. Third, the evaluation stage, the school will evaluate the efficiency and effectiveness of the ease of marketing of products produced by vocational students [26].

3. RESULTS AND DISCUSSION

The production unit of State Vocational High School 3 South Tangerang focuses on selling services, namely documentation services for formal and informal events such as weddings and gatherings, logo design services, or banners and banners. In addition, SMK 3 has a workshop to provide vehicle repair services. New

sales activities are carried out directly or through the alumni network only, such as at bazaars, school activities, or alumni gathering activities. Regarding marketing, the production unit of State Vocational High School 3 South Tangerang is still word of mouth and has not used online marketing such as social media or e-commerce accounts. The production unit has taken several steps to increase product sales, including providing product price discounts and shipping discounts, using paid advertising, and involving students and teachers for promotions using their respective social media accounts. After getting information from interviews with the principal and the head of the production unit of State Vocational High School 3 South Tangerang, it was found that the main problem faced was the absence of online marketing implementation, in this case, digital marketing. In addition, the production unit of State Vocational High School 3 South Tangerang has several other obstacles in the implementation of production and sales, including: i) Budget limitations and lack of transparency in the management team in business; ii) Limited capital in purchasing materials for product manufacture; iii) Limitations access to delivery services; iv) Lack of service quality; v) There is no permanent production staff so that the standard of production varies.

3.1. Implementation of e-commerce in State Vocational High School 3 South Tangerang production unit

3.1.1. Taking photos or product documentation

Taking pictures or documentation aims to present visually attractive content on e-commerce accounts and make products look more detailed and attractive. Because the production unit of State Vocational High School 3 South Tangerang is more inclined to service sales, so taking pictures or documentation is different from selling ordinary products. Researchers chose pictures from videos or photos documented by the production unit of State Vocational High School 3 South Tangerang for documentation services for formal and informal events such as weddings or gatherings. In addition, the design team also created attractive posters using the Corel Draw application to describe the sales of these documentation services.

Furthermore, logo creation services are not much different from event documentation services. Researchers chose the production unit logo to be an image that will be used in the marketplace. In addition, the design team also created attractive posters using the Corel Draw application to describe the sale of the logo creation service.

Finally, researchers chose to take pictures of the State Vocational High School 3 South Tangerang workshop and the production unit, which were repairing several vehicles for vehicle repair services. This shooting aims to attract consumer confidence regarding the credibility and skills of the production unit of State Vocational High School 3 South Tangerang. In addition, the design team also helped create attractive posters using the Corel Draw application to describe the sales of these vehicle repair services.

3.1.2. Editing photos or documentation and creating a Shopee account

Furthermore, image editing or documentation is carried out so that the resulting images can become a good quality catalog. The editing software used is Adobe Photoshop CC 2015. After editing the image, a Shopee State Vocational High School 3 South Tangerang account was created because previously, the production unit did not have any e-commerce account. Account creation begins with creating a Shopee Seller account for State Vocational High School 3 South Tangerang. After the Shopee seller account is formed, upload the edited photo or catalog into the system. In addition to uploading photos or catalogs, filling in the required information on the Shopee seller account such as store descriptions, image descriptions, and the main layout form of the Shopee seller account at State Vocational High School 3 South Tangerang.

The Shopee marketplace was chosen because it offers the benefit of having an account that can only be accessed via a mobile and is particularly socially oriented [27]. Seller's care about their store's reputation and how to gather customers so that shoppers have a better shopping experience. There are no commission and no registration fees, but sellers can buy paid advertising at their own pace. After the product and information have been uploaded, the next step is to register a Shopee seller account at State Vocational High School 3 South Tangerang with Shopee partners. This is so that State Vocational High School 3 South Tangerang will benefit from the features provided by Shopee, as well as simplify marketing and transaction processes.

3.1.3. Conducting webinar implementation of e-commerce (Shopee)

The last stage in implementing e-commerce is conducting a webinar and creating a module on social media and e-commerce. This webinar explains the definition of e-commerce, a brief explanation of Shopee and the features that Shopee sellers can utilize. In addition, the researcher also explained the strategy to make the store more attractive and organized in terms of visualization and writing. The webinar is held online using Zoom Meeting due to restrictions on activities during the COVID-19 pandemic. The webinar was attended by

teachers, especially the management of the production unit and students of State Vocational High School 3 South Tangerang.

From the implementation of e-commerce that has been implemented, researchers distributed questionnaires in the form of Google Forms to several teachers to know the effectiveness and impact of implementing e-commerce at the production unit of State Vocational High School 3 South Tangerang in increasing sales of their services and products [28]. The use of e-commerce in the production unit can enhance sales figures. It also makes easier for the production unit team to advertise and communicate/interact with consumers, according to the questionnaires that have been distributed.

With attractive product photos, potential consumers can overview the work results of the services provided by the production unit, and complete information about store locations or store descriptions can make it easier for consumers to visit the production unit of State Vocational High School 3 South Tangerang. In addition, by using e-commerce, the service for the production unit of State vocational high school 3 South Tangerang is better because consumers can provide testimonials from the products purchased or services received. If the customer testimonials are good, there will be more customers from a sale of these products/services.

The use of e-commerce also makes the production unit of State Vocational High School 3 South Tangerang stronger in a competitive position because the system can analyze items that consumers usually look for and then recommend other relevant items. This can also be seen in the increasing number and diversity of consumers, ranging from children, teenagers, adults, and the elderly. However, there are times when people still find it difficult to shop with e-commerce, among others, do not understand the application, have not mastered shopping online [29]. Apart from the consumer side, problems also came from the production staff where the staff still did not fully understand the features of the Shopee seller. From the description above, it can be concluded that the implementation of e-commerce activities at the production unit of State Vocational High School 3 South Tangerang has succeeded in increasing the image of the production unit. Marketing activities through online are more effective and efficient than direct marketing. Besides that, online marketing also does not require much time, effort, and materials so it is easier to implement.

4. CONCLUSION

As an effort to develop teaching factory learning production through the business unit of State Vocational High School 3 South Tangerang, Banten, Indonesia the application of e-commerce provides many benefits for schools and students. E-commerce uses the latest technology, such as the internet, to facilitate business activities in the business world. Utilization of e-commerce carried out by the production unit of State vocational high school 3 South Tangerang through the Shopee page. Through the Shopee page, the production unit of can introduce products more quickly, effectively, and efficiently, especially during this COVID-19 pandemic. Consumers can also get information faster and make purchases or product orders. The benefits felt by the production unit both students and teachers, when the production unit implements e-commerce, sales turnover increases rapidly, the number of consumers, as a means of promotion, ease of transaction does not need to meet directly with buyers and can expand the business. In addition to the positive benefits of implementing e-commerce, there are several obstacles faced by the production unit of State Vocational High School 3 South Tangerang, Banten, namely: i) Weak human resources (students and teachers); ii) High costs; iii) Intense competition between SMK products outside Banten Province; iv) The emergence of plagiarism of ideas and products; v) Telecommunications networks and prone to fraud and fraud.

There are some limitations of this research. This research only focused on one marketplace, namely Shopee, for use by State Vocational High School 3 South Tangerang. It is expected to explore more marketplaces such as Tokopedia, Lazada, and JD.ID to be able to expand market reach and increase sales figures.




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REFERENCES

- [1] D. M. Makhubele and S. Simelane-Mnisi, "Learning activities in the Technology subject to engage learners in the senior phase of schooling," *World Transactions on Engineering and Technology Education*, vol. 18, no. 4, pp. 438–443, 2020.
- [2] S. Wahjusaputri, Bunyamin, S. Fitriani, T. I. Nastiti, and A. Syukron, "Teaching Factory Model for Increasing the Competency of Vocational Secondary Education Students in Indonesian Territory," *International Journal of Innovation, Creativity and Change*, vol. 11, no. 1, 2020.
- [3] S. S. Abed, Y. K. Dwivedi, and M. D. Williams, "Social Media as a Bridge to E-commerce Adoption in SMEs: A Systematic Literature Review," in *The Marketing Review*, 2015.
- [4] S. Wahjusaputri, B. Bunyamin, and Bakrun, "Critical Success Factors in Implementing Teaching Factory- Based Competency for Vocational High School Students," *Cakrawala Pendidikan*, vol. 40, no. 3, 2021, doi: <http://doi:10.21831/cp.v40i3.2887>.
- [5] L. Louw and Q. Deacon, "Teaching Industrie 4.0 technologies in a learning factory through problem-based learning: Case study of a semi-automated robotic cell design," *Procedia Manufacturing*, vol. 45, pp. 265–270, 2020, doi: [10.1016/j.promfg.2020.04.105](https://doi.org/10.1016/j.promfg.2020.04.105).
- [6] D. Mourtzis, N. Boli, G. Dimitrakopoulos, S. Zygomalas, and A. Koutoupes, "Enabling Small Medium Enterprises (SMEs) to improve their potential through the Teaching Factory paradigm," *Procedia Manufacturing*, vol. 23, no. 2017, pp. 183–188, 2018, doi: [10.1016/j.promfg.2018.04.014](https://doi.org/10.1016/j.promfg.2018.04.014).
- [7] Y. Nurdani and P. I. Sandhyaduhita, "Impact of express delivery service quality towards repurchase intention by B2C and C2C: A case of Indonesia," *2016 International Conference on Advanced Computer Science and Information Systems, ICACSIS 2016*, pp. 221–227, 2017, doi: [10.1109/ICACSIS.2016.7872779](https://doi.org/10.1109/ICACSIS.2016.7872779).
- [8] V. Lahtinen, T. Dietrich, and S. Rundle-Thiele, "Long live the marketing mix. Testing the effectiveness of the commercial marketing mix in a social marketing context," *Journal of Social Marketing*, vol. 10, no. 3, pp. 357–375, 2020, doi: [10.1108/JSOCM-10-2018-0122](https://doi.org/10.1108/JSOCM-10-2018-0122).
- [9] B. Harsandi, J. Purnama, M. A. A. Soetomo, and M. Galinium, "Internet user trust measurement analysis towards e-commerce system in Indonesia," *2013 International Conference on Advanced Computer Science and Information Systems, ICACSIS 2013*, pp. 225–230, 2013, doi: [10.1109/ICACSIS.2013.6761580](https://doi.org/10.1109/ICACSIS.2013.6761580).
- [10] M. A. Benzaghta, A. Elwolda, M. Mousa, I. Erkan, and M. Rahman, "SWOT analysis applications: An integrative literature review," *Journal of Global Business Insights*, vol. 6, no. 1, pp. 55–73, 2021, doi: [10.5038/2640-6489.6.1.1148](https://doi.org/10.5038/2640-6489.6.1.1148).
- [11] R. Rahayu and J. Day, "Determinant Factors of E-commerce Adoption by SMEs in Developing Country: Evidence from Indonesia," *Procedia - Social and Behavioral Sciences*, vol. 195, pp. 142–150, 2015, doi: [10.1016/j.sbspro.2015.06.423](https://doi.org/10.1016/j.sbspro.2015.06.423).
- [12] T. Muthuprasad, S. Aiswarya, K. S. Aditya, and G. K. Jha, "Students' perception and preference for online education in India during COVID -19 pandemic," *Social Sciences & Humanities Open*, vol. 3, no. 1, p. 100101, 2021, doi: [10.1016/j.ssaho.2020.100101](https://doi.org/10.1016/j.ssaho.2020.100101).
- [13] H. A. Muhyi and A. Chan, "The Penta Helix Collaboration Model in Developing Centers of Flagship Industry in Bandung City," *Review of Integrative Business and Economics Research*, vol. 6, no. 1, pp. 412–417, 2017.
- [14] C. Prinz, F. Morlock, S. Freith, N. Kreggenfeld, D. Kreimeier, and B. Kuhlenkötter, "Learning Factory Modules for Smart Factories in Industrie 4.0," *Procedia CIRP*, vol. 54, pp. 113–118, 2016, doi: [10.1016/j.procir.2016.05.105](https://doi.org/10.1016/j.procir.2016.05.105).
- [15] H. Brüggemann, S. Stempin, and J. M. Meier, "Consideration of digitalization for the purpose of resource efficiency in a learning factory," *Procedia Manufacturing*, vol. 45, no. 2019, pp. 140–145, 2020, doi: [10.1016/j.promfg.2020.04.085](https://doi.org/10.1016/j.promfg.2020.04.085).
- [16] N. W. Rahayu and F. Anggriawan, "Evaluating Indonesian C2C and B2C quality using eQual: A preliminary research," *Proceedings of 2014 International Conference on Electrical Engineering and Computer Science, ICEECS 2014*, no. November, pp. 163–167, 2014, doi: [10.1109/ICEECS.2014.7045238](https://doi.org/10.1109/ICEECS.2014.7045238).
- [17] J. W. Creswell and J. David Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*, Fifth edit. Los Angeles: SAGE, 2018.
- [18] R. Kumar, A. Sachan, and A. Mukherjee, "Qualitative approach to determine user experience of e-government services," *Computers in Human Behavior*, vol. 71, pp. 299–306, 2017, doi: [10.1016/j.chb.2017.02.023](https://doi.org/10.1016/j.chb.2017.02.023).
- [19] A. Irawan, M. Risa, A. Pratomo, and R. Mantala, "The Role of E-Commerce in Supporting the Promotion Process for Products and Services for Students of the Catering Study Program at Smkn 4 Banjarmasin (in Indonesian)," *Proceeding of National Conference on Asbis*, vol. 4, pp. 25–34, 2019.
- [20] A. Haris, "Learning system management based on teaching factory in Indonesia," *Journal of Advanced Research in Social Sciences and Humanities*, vol. 2, no. 4, pp. 237–248, 2017, doi: [10.26500/jarssh-02-2017-0402](https://doi.org/10.26500/jarssh-02-2017-0402).
- [21] S. Dixit, "E-Retailing Challenges and Opportunities in the Global Marketplace," in *A volume in the Advances in E-Business Research (AEBR) Book Series*, 2016, pp. 99–120.
- [22] Wafroturrohmah, M. F. J. Syah, Suyatmini, F. Faathirishshofia, and N. Rofi'ah, "Evaluation on teaching factory implementation: Studies in management, workshop, and learning-pattern aspects," *International Journal of Innovation, Creativity and Change*, vol. 12, no. 2, pp. 203–215, 2020.
- [23] S. Wahjusaputri, S. Fitriani, and S. Syarif, "Canvas Model Business as an Innovation of Teaching Factory Learning in the Fashion Department of 27 Public Vocational High School, Jakarta," *Dinamika Pendidikan*, vol. 14, no. 2, pp. 142–154, Dec. 2019, doi: [10.15294/dp.v14i2.21167](https://doi.org/10.15294/dp.v14i2.21167).
- [24] S. Wahjusaputri, S. Fitriani, and I. El Khuluqo, "The Implementation of Teaching Factory and Its Implication to Vocational High School Student's Competence in the Industrial Area of Jakarta Province, Indonesia," in *Proceeding Kolokium Doktor dan Seminar Hasil Penelitian UHAMKA*, Apr. 2017, vol. 1, no. 2, pp. 21–28.
- [25] I. Hussain, S. Mu, M. Mohiuddin, R. Q. Danish, and S. A. Sair, "Effects of sustainable brand equity and marketing innovation on market performance in hospitality industry: Mediating effects of sustainable competitive advantage," *Sustainability (Switzerland)*, vol. 12, no. 7, pp. 1–19, 2020, doi: [10.3390/su12072939](https://doi.org/10.3390/su12072939).
- [26] C. Yohana, "Factors influencing the development of entrepreneurship competency in vocational high school students: A case study," *International Journal of Education and Practice*, vol. 8, no. 4, pp. 804–819, 2020, doi: [10.18488/journal.61.2020.84.804.819](https://doi.org/10.18488/journal.61.2020.84.804.819).
- [27] R. Rahayu and J. Day, "Determinant Factors of E-commerce Adoption by SMEs in Developing Country: Evidence from Indonesia," *Procedia - Social and Behavioral Sciences*, vol. 195, pp. 142–150, 2015, doi: [10.1016/j.sbspro.2015.06.423](https://doi.org/10.1016/j.sbspro.2015.06.423).
- [28] Y. Yusnita et al., "The Effect of Professional Education and Training for Teachers (PLPG) in Improving Pedagogic Competence and Teacher Performance," *Tadris: Jurnal Keguruan dan Ilmu Tarbiyah*, vol. 3, no. 2, p. 123, Dec. 2018, doi: [10.24042/tadris.v3i2.2701](https://doi.org/10.24042/tadris.v3i2.2701).
- [29] D. Centea, I. Singh, and M. Elbestawi, "SEPT Approaches for Education and Training using a Learning Factory," *Procedia*

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