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Implementing the teaching factory model in English language instruction: Students' perceptions and learning strategies

Desi Tri Cahyaningati[1], Lusia Eni Puspandari[2], Dian Asa Utari[3], Miftachudin Miftachudin[4]

Politeknik Perkapalan Negeri Surabaya, INDONESIA[1,2,3,4]
[2]Email: lusiaeni@ppns.ac.id

Abstract - Many vocational schools have been bringing their educational practice closer to industry along with the concept of Teaching Factory (TEFA) to adjust the students' skills as close as the industry demands. The implementation of TEFA based curriculum in one of vocational higher education in Surabaya for all subjects including English subject has been performed since 2019. In English classes, the Teaching Factory-Based Strategy covers two methods: product-based learning and flipped classroom. This research aims to explore the implementation of TEFA-based strategy and the two methods by revealing students' perceptions and responses on the strategy. This research is descriptive qualitative research in which data were obtained through questionnaires and interviews. The students observed were from 4 different study programs in this PPNS. The results of this study show positive perceptions of students toward TEFA – based strategy implemented in the classroom even though there are some obstacles faced by both students and lecturers. Hopefully this research can contribute practically to English teachers who are adopting TEFA in English language teaching.

Keywords: teaching factory; product-based learning; vocational higher education; flipped learning

1. Introduction

Students naturally expect that upon graduation, they will be equipped with the skills and knowledge necessary to succeed in the workplace. This expectation is particularly strong among those attending vocational schools, where the primary aim is to prepare students for direct entry into the workforce. These students anticipate that their learning outcomes will provide them with work-ready competencies or the self-reliance needed to thrive in a professional environment. Therefore, vocational schools are expected to ensure that their curricula, teaching methods, and training facilities are aligned with industry needs, equipping graduates with the necessary skills to meet the challenges of the workplace.

Over the years, the Indonesian government has made significant efforts to improve the quality of education, particularly in vocational training. These efforts have included enhancing curriculum content, increasing access to educational resources, and upgrading teaching methods. The government has recognized the importance of education in fostering economic growth and addressing unemployment. However, despite these efforts, preliminary observations reveal a concerning gap between the competencies of vocational school graduates and the skills demanded by industries. One of the key challenges is the inadequacy of laboratory and training facilities, which struggle to keep pace with rapid technological advancements in various industries. This misalignment between the skills of graduates and the needs of the industry has been a persistent issue, preventing vocational school graduates from fully meeting employers' expectations.

Supporting this concern, a study conducted by the Central Statistics Agency (BPS) in 2017/2018 indicated that vocational school graduates face the highest unemployment rate when compared to graduates from other educational streams. According to the Ministry of Education's Directorate General of Vocational Education (Direktorat Jenderal Pendidikan Vokasi) in 2020, despite the increasing number of vocational institutions, many graduates remain unemployed or underemployed. This situation highlights the disconnect between what students are taught and the practical skills required by the job market, leading to frustration for both students and employers.

To address these challenges, the Indonesian government, through the Ministry of Education, has introduced initiatives aimed at improving the quality and relevance of vocational education. One such initiative is the creation of teaching factories, which aim to bridge the gap between education and industry needs. The teaching factory model is a strategic approach that integrates learning and practical training with real-world industry requirements. It is designed to provide students with hands-on experience in environments that simulate actual work settings, thereby aligning their competencies with industry standards.

The concept of the teaching factory model combines various types of competency-based and production-based learning models. It emphasizes practical, work-integrated learning, where students engage in real production and service activities within the school or in collaboration with industry partners. These activities are carried out following established industry standards and procedures, ensuring that students gain practical skills that are directly applicable in the workplace. By engaging in this model, students not only develop technical expertise but also cultivate soft skills such as teamwork, problem-solving, and communication, which are critical in today’s workforce.

The teaching factory model also fosters collaboration between vocational schools and industries, ensuring that the education provided is aligned with the evolving needs of the job market. It enables industries to have a direct role in shaping the competencies of future workers, ensuring that graduates are well-equipped to meet the challenges and demands of the industry. Moreover, the model allows industries to have access to a pool of well-trained and job-ready individuals, addressing both the skills gap and the unemployment issue.

This approach is supported by several studies, including one by Wahjusaputri et al (2020), which highlights the effectiveness of teaching factories in enhancing students' competencies and improving their employability. By integrating theoretical knowledge with practical experience, the teaching factory model provides a comprehensive learning experience that prepares students for the realities of the workforce.

While the Indonesian government has made significant strides in improving the quality of vocational education, there remains a need for further alignment between educational outcomes and industry needs. The implementation of teaching factories represents a promising solution to this challenge, ensuring that vocational school graduates are better prepared for the demands of the modern workforce. This initiative not only enhances students' employability but also contributes to the overall development of a skilled workforce that can drive economic growth and innovation.

Teaching Factory (Tefa) learning model is a production/service-based learning model in vocational schools which refers to standards and procedures applicable in the industry and is implemented in an industrial-like atmosphere (Ministry of Education and Culture, 2019). It is believed that implementing a teaching factory is a promising method for bridging the competency gap between the transfer of knowledge in the classroom and real-world settings. According to the Press conference by The Ministry of Education, Culture, Research and Technology (2022) in 2021, the number of Vocational High Schools (SMK) implementing the teaching factory learning model has increased by seven percent to 52 percent compared to 2020. This data is based on the results of a survey on strengthening vocational education conducted by the Indonesian Political Indicators survey institute at the end of 2021. Higher educational institutions or Polytechnics have also tried to bring their educational practice closer to industry along with the concept of a Learning Factory and Teaching Factory. The "factory-to-classroom" mode of such approach aims at transferring the real industry environment to the classroom (Mavrikios et al, 2018). The implementation of Teaching Factory has also changed the way English is taught in Polytechnics. The English language teaching in Polytechnics has been focusing on the English products made by students.

As one of vocational higher education, Shipbuilding Polytechnics, Politeknik Perkapalan Negeri Surabaya (PPNS) has implemented Teaching Factory since 2019 but it then faced some challenges during the Covid-19 pandemic. The pandemic was the hardest moment for all education levels in managing the teaching learning process, since the infrastructure was not supported.(Nopilda, 2018). That situation could be overcome by PPNS which has developed the Learning Management System (LMS) to be used as media online for teaching before the pandemic. Inspired by top global institutions which follow hybrid educational models which is a mix of online and in-person learning (Mourtzis, 2021), PPNS developed the Teaching Factory-based strategy to teach English for Specific Purposes (ESP) for Engineering students which combined online learning and product-based learning. In order to support the Teaching Factory curriculum being implemented during the social distancing, the English subject which is also the basic subject in all Engineering Departments were organized by combining product-based learning and flipped classroom which can be held in form of synchronized and asynchronized system, especially for practice class.

Flipping a classroom entails turning the traditional classroom on its side (Güler et al., 2023). Students are encouraged to learn new material outside of class through reading and watching recorded lectures. Bachiller and Badía (2020) emphasise the importance of students retaining and analysing class material. According to Huang et al. (2023), students apply what they've learned in class to solve group problems with peer instruction. Students gain a comprehensive understanding of the subject matter, resulting in a more in-depth learning experience. Karjanto and Acelajado (2022) argue that this approach to learning is more dynamic and student-centred than traditional lectures.

The Flipped Classroom method has been carried out by English Lecturers to build self-paced learning environment for students in which they can learn according to their learning ability by using technology, the LMS, as a tool. The English subject is taught every two semesters by dividing it into 2 sections: The Theory class and Practice Class. The Practice Class is called "learning in the classroom" emphasizes active learning activities and the opportunity for collaboration among students is high. This is where students finish the project given by the lecturers and make the English products.

Like many other strategies, drawbacks and challenges happened during the implementation of Teaching Factory-based strategy. A research by Indrastana (2023) target students' perception on the implementation of Teaching Factory method in English teaching in Polytechnic, presenting a satisfying result. However, the research has not revealed the effect of teaching factory model on students' English competence. Therefore, PPNS English lecturers need to evaluate the implementation of the strategy by initially reveal its conformity to students' learning strategy. Next, students' perception towards the strategy is also essential to be explored which may indicate students' motivation in learning English and improvement of their English competence.

In order to find out the effectiveness of TEFA Curriculum by implementing Product Based Learning Strategy modified with Flipped Classroom using Learning Media System organized by institution, the characteristic of students' learning strategy must be analyzed and the students perception about the PBL must be observed. Therefore the focus of this study was to answer the following research questions:

(1) What learning strategies were dominated by engineering students in PPNS?

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(2) How is the influence of students perception with the English Proficiency results?

2. Method

The underlying method of this research is descriptive qualitative method. Descriptive research is aimed to describe a phenomenon along with its characteristics. Qualitative research is considered holistic and involves a lot of data collection from various sources to obtain a deeper understanding of the research participants, including their perceptions, opinions, and attitudes (Nassaji, 2015). Therefore, the design of this research adopts the descriptive qualitative design. This research tries to explore and describe students learning strategy, their perception on Teaching Factory-based strategy and students' English competence after the implementation of the strategy, qualitatively.

The trustworthiness of the data used is tested by triangulation technique. Testing data trustworthiness is necessary in qualitative research for the sake of validity and reliability as well as the level of confidence of the data (Sugiyono, 2017). The triangulation technique is a researcher's effort by comparing some data taken from the observation, interview, and questionnaire, documents, and then combined for a clear understanding of the results (Yuliani, 2018).

In this research, multiple data sources are taken by using some data collection instruments: interviews, observations, and questionnaires. There are two types of questionnaires. The first consists of 50 questions indicating students' learning strategy. The second questionnaire consists of 17 close-ended questions which target students' perception on the implementation of Teaching Factory-based strategy in English class. All the questionnaire use Likert scale and are collected through google form. They were given to 120 students and 4 English lecturers in PPNS. Meanwhile, the interview was done face to face by involving 12 students and 4 English lecturers. The data collected were then analyzed descriptively to clearly define PPNS students' preference on learning strategy, their perception on the use of TEFA-based strategy, and their English competence after the implementation of the strategy.

The participants of this research are 8th semester students of 4 study programs in PPNS: Safety Engineering, Design and Manufacture Engineering, Design and Construction Engineering, and Automation Engineering. All the students got English 1, 2, and 3. 120 students were the respondents and 12 of them were interviewed face to face.

3. Results and Discussion

3.1 Students' Learning Strategy

To identify the learning strategy preferred by Engineering students in PPNS, the first questionnaire consisting of 50 questions was distributed. The result shows that students are more into the compensation and cognitive learning strategy.

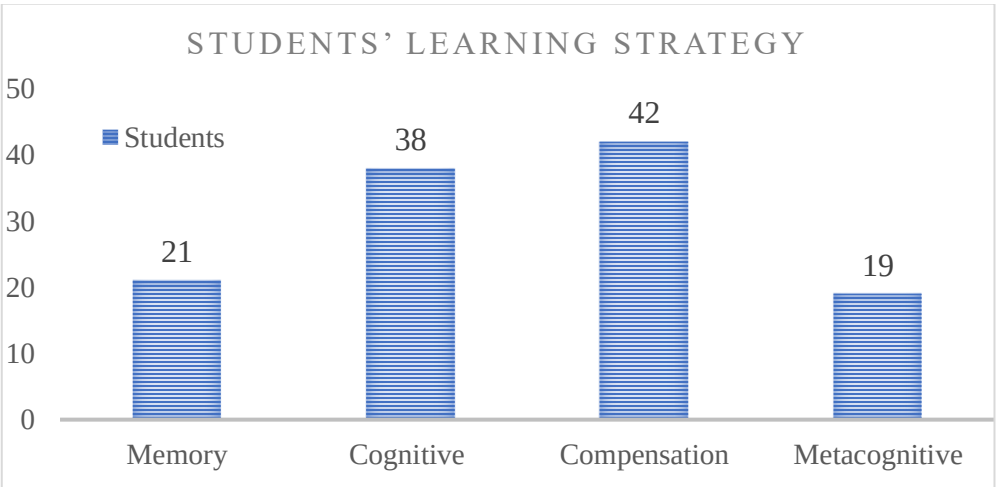

Figure 1 Students Learning Strategy

To recognize the students' learning strategy there are some questions adopted from the

Strategy Inventory for Language Learning (SILL) which tell the kinds of strategies used in learning English. From diagram 1, it can be seen that most PPNS students are interested in compensation learning strategy. This learning strategy shows the limitation of students' knowledge while they understand new English words or vocabulary. As a result, the students are wonder to learn English through watching videos, playing games, quizzes, and guessing missing words toward this learning strategy. However, the second learning strategy most chosen by the students is cognitive. It shows that the students are attracted to explore their way of thinking such as problem-solving, case study, and product-based learning. It can be implemented in several topics and tasks; for instance, asking the students to describe object specifications, describing places, explaining rules and regulations in the workshop, and explaining processes and procedures. These topics and tasks require the students to focus directly on the specific term in producing new words without memorization. Therefore, most students choose these two learning strategies to be in line with the TEFA curriculum in PPNS which focuses on product-based learning.

3.2 Students' Perception

The questionnaire of students' perception consists of 17 close-ended questions. The questions reveal students' opinion on the Product-Based Learning which involves English projects like video and magazine articles. The questions also seek to explain students' understanding of English materials given on theory and practice class, altogether with their opinion on how effective the flipped classroom (theory and practice class) is.

Table 1 Student Perceptions of the Teaching Factory Learning Model in English Class

No	Questions	strongly disagree	disagree	neutral	agree	strongly agree	Total
1	The tasks and assignments I do for English Class is valuable to me	0	3	24	58	35	120
2	The activities during the English Class improve my understandings on the key concept/materials	0	7	27	53	33	120
3	Doing the English Projects (video, posters, and magazine articles) improve my English skills	0	5	31	56	28	120
4	I like to do the English Projects (video, posters, and magazine articles)	0	0	25	55	40	120
5	I can do well in my English theory and practice class	0	3	31	47	39	120
6	I am confident about my ability on the English final exam.	0	5	31	56	28	120
7	Peers' and lecturer's feedback help me to improve my English skills	0	0	25	55	40	120
8	I have what it takes to do well in English Practice class.	0	3	31	47	39	120
9	Practice class improve my English communicative skills	0	3	24	58	35	120
10	Theory class is significant for accomplishing the English projects	0	3	24	58	35	120
11	I understand why I should do English projects (video, posters, and article projects)	0	5	28	48	39	120
12	I understand how to make the English projects (video, posters, and article projects)	0	3	36	44	37	120
13	Using LMS for theory class is easy	0	4	19	62	35	120
14	Materials on LMS is meaningful	0	3	28	50	39	120

15	Watching video lectures and read the materials before class prepare me for the practice class activity	0	2	18	67	33	120
16	Reading the materials before class helps me do the tasks and assignments	0	7	22	60	31	120
17	I can easily understand the materials given through LMS	0	8	28	52	32	120

The results of the questionnaire indicated that the students' opinion on Product Based Learning that they have done during the pandemic period by learning using video and kinds of technologies both in theory and practise classes had good awareness. It can be seen from the answers of the questionnaire which dominated by responding the questions with "agree" and "strongly agree". The number of respondents who answered "disagree" was only a few. However, those who answered "neutral" are only around 20 percent.

The table above presents student responses to various statements regarding their experience with the teaching factory learning model in English classes. It includes data on the perceived value of tasks and assignments, the effectiveness of class activities, the impact of projects, and the use of Learning Management Systems (LMS). The responses are categorized on a Likert scale, ranging from "strongly disagree" to "strongly agree." Below is a critical analysis of the table's results, considering both strengths and potential areas for improvement.

A significant majority of students (58 agreeing and 35 strongly agreeing out of 120) find the tasks and assignments in English class valuable to them (Statement 1). This suggests that students generally see the importance of their work in improving their English skills. Similarly, most students feel that the activities in class improve their understanding of key concepts (Statement 2) and the English projects, such as videos and posters, enhance their skills (Statement 3). However, the moderate number of neutral responses (31 for Statement 3) indicates some uncertainty regarding the direct impact of projects on language acquisition, which could be further explored.

The enthusiasm for projects (Statement 4) is also evident, with 55 agreeing and 40 strongly agreeing, indicating that creative projects such as videos, posters, and articles resonate with students. This aligns with the theory that active, project-based learning can engage students more effectively compared to traditional teaching methods.

Students exhibit a relatively high level of confidence in their ability to perform well in both theory and practice classes. A total of 47 students agree, and 39 strongly agree that they can do well in their English theory and practice classes (Statement 5), and similar levels of confidence are seen for the English final exam (Statement 6). However, some students (31 neutral for Statement 5 and 31 neutral for Statement 6) show signs of uncertainty. This suggests that while many students feel capable, there is a portion who may need additional support or have mixed feelings about their preparedness for assessments. Further support or individualized feedback could help bridge this gap.

The data reveals a positive correlation between peer and lecturer feedback and improvements in English skills. With 55 students agreeing and 40 strongly agreeing (Statement 7), feedback seems to play a crucial role in the students' learning process. Feedback, particularly in a practical learning context, can clarify misunderstandings and guide improvements. The improvement of communicative skills in the practice class (Statement 9) is widely agreed upon, indicating that students recognize the benefits of interactive and communicative activities in enhancing their language proficiency.

A notable trend in the responses related to LMS (Statements 13-17) suggests that students find the system generally useful, though with some areas for improvement. For instance, Statement 13 (ease of using LMS) shows a mix of responses, with 62 students agreeing and 35 strongly agreeing, suggesting that while LMS is an effective tool for many, some students may face challenges in navigating the platform. The majority of students (50 agreeing and 39 strongly agreeing) feel that materials on LMS are meaningful (Statement 14), indicating that the resources provided are perceived as relevant and valuable for their learning. However, some students (28 neutral) might find the LMS content less engaging or difficult to comprehend, pointing to potential areas for enhancing the platform's user-friendliness or offering supplementary materials.

Statements 15 and 16 reveal that preparatory activities, such as watching video lectures and reading materials before class, are perceived positively. These activities seem to prepare students well for practice class activities, which is a promising finding as it suggests that students are being effectively primed for hands-on learning. However, the 18 neutral responses for Statement 15 and the

22 neutral responses for Statement 16 indicate that some students may not fully engage with or benefit from the preparatory materials. This could be attributed to a lack of motivation, technical issues, or differing learning preferences.

3.3 Students' English Competence

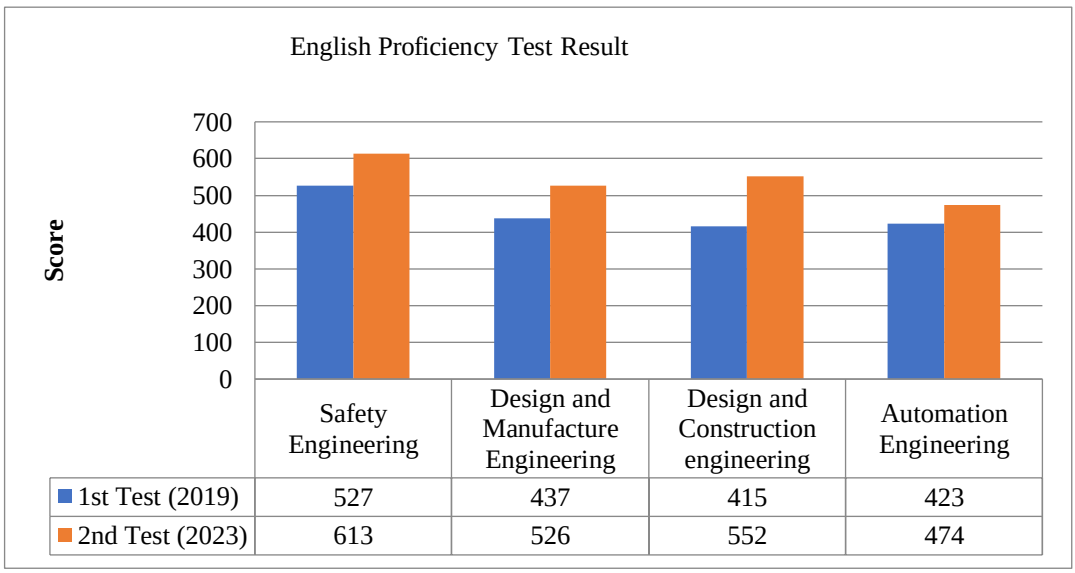

Figure 2 English Proficiency Test Result

From Figure 2, a clear comparison of the pre-test results from the first semester and the post-test results from the last semester reveals a marked improvement in the total scores achieved by students across both study programs. This significant increase in the post-test scores compared to the pre-test scores highlights the effectiveness of the interventions implemented throughout the academic period, particularly the application of the product-based learning (PBL) method in teaching English.

The pre-test conducted in the first semester likely serves as a baseline measurement of students' language proficiency and understanding of the key concepts being taught in the English program. The initial scores provide a snapshot of the students' starting points, reflecting their current knowledge, skills, and potential areas for improvement. These baseline results are essential for understanding the starting competence levels of students, which is crucial for evaluating the impact of teaching strategies on student progress.

When we compare these pre-test results with the post-test scores taken in the final semester, the significant increase in total scores signals a substantial improvement in student performance over time. This improvement suggests that the interventions introduced, particularly the product-based learning method, played a pivotal role in enhancing the students' English skills.

The marked improvement in student performance can largely be attributed to the implementation of product-based learning (PBL), which emphasizes active engagement with real-world tasks and the creation of tangible outcomes such as videos, posters, articles, or other project outputs. This learning approach encourages students to apply theoretical knowledge in practical contexts, which not only enhances their language skills but also promotes critical thinking, creativity, and problem-solving abilities.

PBL typically encourages students to work collaboratively, develop communication skills, and produce work that demonstrates their understanding of the material. By focusing on the production of tangible outputs, students are able to see the real-world applications of what they are learning, which can be highly motivating. Additionally, the process of completing projects allows students to receive continuous feedback from peers and instructors, further reinforcing their learning and enabling them to make improvements along the way.

The significant increase in post-test scores indicates that the students' language proficiency and understanding of English concepts improved over the course of the semester. This improvement is not just in terms of raw test scores, but also reflects a deeper engagement with the material. It suggests that the students were able to internalize the lessons taught through the PBL method and apply them effectively, as evidenced by their better performance in the post-test.

Furthermore, the nature of PBL allows for more personalized learning experiences. Since the students work on projects that often align with their interests or career goals, they are likely more motivated to engage deeply with the learning material. This intrinsic motivation, coupled with the hands-on approach of creating a product, can lead to a better understanding of the material, as opposed to more passive forms of learning that might not provide as much engagement or tangible outcomes.

The improvement seen in the post-test results also aligns with students' positive perceptions of the learning process, particularly their experiences with product-based projects. Many students report that the projects, such as videos and posters, not only enhanced their language skills but also contributed to their overall understanding of English. When students perceive the learning activities as valuable and aligned with real-world applications, they are more likely to invest effort and engage fully with the material.

Additionally, the feedback and support provided throughout the course likely played a role in this improvement. Continuous feedback from peers and instructors allows students to identify areas for improvement and refine their skills, which is a key element of the PBL approach. This constant cycle of assessment and feedback contributes to students' growth, which is reflected in their improved post-test scores.

The significant improvement from pre-test to post-test demonstrates that the product-based learning method was effective in enhancing students' English skills. This method not only improved test scores but also likely contributed to greater student engagement, higher motivation, and a better understanding of how to apply English in practical, real-world contexts.

The findings suggest that the adoption of PBL can have a transformative effect on students' learning experiences, particularly in language acquisition. By combining theoretical knowledge with practical applications, PBL helps students bridge the gap between classroom learning and real-world use of the language. Given the positive results observed in this analysis, it would be beneficial for educational institutions to continue to integrate and expand product-based learning methods in English language programs.

In conclusion, the analysis of the pre-test and post-test scores shows a clear and significant improvement in student performance, which can be attributed to the application of product-based learning. This improvement not only reflects better test scores but also indicates enhanced student engagement, greater motivation, and a deeper understanding of the material. Moving forward, the continued use and refinement of the PBL method can further enhance the effectiveness of English language education.

4. Conclusion

In the context of service product TEFA (Teaching Factory) learning, the primary focus is on aligning the competency standards with the performance requirements of the industry. This alignment ensures that students acquire skills and knowledge that meet the expectations of the workforce, which ultimately enhances their employability and competitiveness in the job market. The positive outcomes observed in this research underscore the effectiveness of TEFA learning in equipping students with the practical experience and readiness required by the industry. By engaging in hands-on, real-world tasks, students not only gain technical expertise but also develop critical soft skills such as teamwork, problem-solving, and communication—skills that are highly valued by employers.

However, while the results of this study highlight the benefits of the current TEFA learning approach, it is essential to consider how other innovative teaching models can further enhance student learning outcomes. One such model is the flipped classroom, which offers a dynamic shift in how content is delivered and how students engage with the material. By moving traditional lectures outside the classroom (via videos or other online resources) and utilizing in-class time for interactive, hands-on activities, the flipped classroom allows for deeper engagement with the content and fosters a more student-centred learning environment.

Based on the findings from this study, several key recommendations can help ensure the successful implementation of the flipped classroom model in future TEFA learning environments.

Preparation of Lecturers: English lecturers must be adequately prepared to implement the flipped classroom model. This preparation includes not only mastering the technical aspects of the model but also ensuring that they are familiar with the pedagogical shifts it entails. Prior to implementation, lecturers should conduct thorough orientations for students to ensure they understand the flipped classroom structure, including expectations for pre-class preparation, in-class activities, and post-class engagement. This proactive approach will help mitigate any confusion or resistance that may arise from students who

are unfamiliar with this teaching method.

Institutional Support: For the flipped classroom model to be effective, lecturers must receive sufficient support from their institution. This support could take the form of professional development opportunities, access to resources and technology, and guidance from administrators in terms of scheduling and workload management. Additionally, institutional support should extend to ensuring that students have the necessary infrastructure, such as reliable internet access, to engage with the online components of the flipped classroom. Strong institutional backing will enable lecturers to implement the model smoothly and confidently, which will ultimately benefit student learning outcomes.

Ongoing Reflection and Adaptation: The implementation of the flipped classroom model should not be seen as a one-time event, but rather as an ongoing process of refinement and improvement. Lecturers should engage in continuous reflection during and after the implementation of the model to assess its effectiveness and identify areas for improvement. This could include soliciting feedback from students on their experiences with the flipped classroom and using this information to make necessary adjustments. Additionally, lecturers should be open to revising their teaching strategies and materials based on their reflections and the evolving needs of their students. This iterative process will ensure that the flipped classroom model remains dynamic and responsive to the changing educational landscape.

Enhancing Student Engagement and Accountability: A successful flipped classroom model relies heavily on students' active engagement with the content before they come to class. Lecturers should ensure that the pre-class materials are engaging, relevant, and aligned with the learning objectives. Moreover, students must be held accountable for completing these preparatory tasks, as their success in in-class activities will depend on the foundation they build through self-paced learning. Strategies to increase student accountability might include regular assessments of pre-class work, quizzes, or discussions that ensure students are prepared for the collaborative, interactive tasks they will undertake in class.

Integrating TEFA and the Flipped Classroom: The flipped classroom model can be seamlessly integrated with the existing TEFA structure. By utilizing the flipped classroom to deliver theory and foundational knowledge outside the classroom, in-class time can be dedicated to more practical, hands-on experiences that mirror industry practices. This combination of flipped learning and TEFA can create an optimal learning environment where students gain both the theoretical understanding and the practical skills needed to excel in the workforce.

In conclusion, the TEFA learning approach has proven effective in preparing students for the workforce, but there is always room for innovation and improvement in teaching methodologies. The flipped classroom model offers a promising avenue for enhancing student engagement and providing more personalized learning experiences. To ensure its successful implementation, careful preparation by lecturers, institutional support, and a commitment to ongoing reflection and adaptation are essential. By incorporating the flipped classroom into the TEFA framework, institutions can foster a more dynamic and student-centred learning environment that better prepares students for the demands of the modern workforce. Ultimately, these efforts will contribute to improving the quality of vocational education and enhancing the employability of graduates.

References

Agwa-Ejon, J. F., & Pradhan, A. (2017). The impact of work integrated learning on engineering education. 2017 IEEE Global Engineering Education Conference (EDUCON), 1258–1265. https://doi.org/10.1109/EDUCON.2017.7943009

Bachiller, P., & Badía, G. (2020). The fip teaching as tool to improving students' sustainable learning performance in a fnancial course. Sustainability, 12(23), 9998. https://doi.org/10.3390/su12239998.

BPS. (2019). "Februari 2019: Tingkat Pengangguran Terbuka (TPT) Sebesar 5,01 Persen." https://www.bps.go.id/pressrelease/2019/05/06/1564/februari-2019--tingkatpengangguranterbuka--tpt-- sebesar-5-01-persen.html.

Choi, J., Lee, J. H., & Kim, B. (2019). How does learner-centered education affect teacher self-efficacy? The case of project-based learning in Korea. Teaching and Teacher Education, 85, 45-57.

Direktorat Jenderal Pendidikan Vokasi. (2020). "Program Kerja Tahun 2021 Direktorat Jenderal Pendidikan Vokasi," Kemendikbud Dirjen Vokasi. Jakarta: Indonesia, 2020.

Divjak, B., Rienties, B., Iniesto, F., Vondra, P., & Žižak, M. (2022). Flipped classrooms in higher education during the COVID-19 pandemic: Findings and future research recommendations. *International Journal of Educational Technology in Higher Education, 19*(1), 1–24..

Günbatar, M. S. (2021). Flipped classroom in higher education: Evaluation of the process in the framework of community of inquiry. *Journal of Educational Technology Systems, 50*(2), 215–254. https://doi.org/10.1177/00472395211031660.

Gijbels, D, Dochy, F dan Van de Bossche, F. (2005) Effects of The Problem Based Learning. A Meta-analysis from theAngle Measurement. Journal Review of Educational Research. Vol.75, 27-49..

Gómez-Pablos, V. B., del Pozo, M. M., & Muñoz-Repiso, A. G. V. (2017). Projectbased learning (PBL) through the incorporation of digital technologies: An evaluation based on the experience of serving teachers. Computers in human behavior, 68, 501-512..

Güler, M., Kokoç, M., & ÖnderBütüner, S. (2023). Does a fipped classroom model work in mathematics education? A meta-analysis. Education and Information Technologies, 28(1), 57–79..

Hasanah, H., & Malik, M. N. (2018). Teaching factory-based for entrepreneurship learning model in vocational high schools.

Indrastana, N. S., Dewangga, V., & Rinda, R. K. (2023). Exploring the students' perception on the use of teaching factory method in English learning. Journal of Applied Studies in Language, 7(1), 15-22.

Hakim, H., Hasmyati, H., Zulfikar, M., Anwar, N. I. A., Santos, H. A. Dos, & Hamzah, A. (2023). Improving student's self-efficacy through inquiry learning model and modeling in physical education. Jurnal Cakrawala Pendidikan, 42(2). https://doi.org/10.21831/cp.v42i2.57759.

Huang, A. Y., Lu, O. H., & Yang, S. J. (2023). Efects of artifcial Intelligence—Enabled personalized recommendations on learners' learning engagement, motivation, and outcomes in a fipped classroom. Computers and Education, 194, 104684

Kementerian pendidikan dan kebudayaan badan penelitian dan pengembangan pusat penelitian kebijakan pendidikan dan kebudayaan. 2019. Risalah Kebijakan: Evaluasi Pelaksanaan Teching Factory Sebagai Upaya Meningkatkan Mutu Lulusan Dan Strategi Pendanaan di SMK. http;://www.puslitjakdikbud.go.id. Sumber: Siaran Pers Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi Nomor : 13/sipers/A6/I/2022

Karjanto, N., & Acelajado, M. J. (2022). Sustainable learning, cognitive gains, and improved attitudes in College Algebra fipped classrooms. Sustainability, 14(19), 12500.

Mavrikios D., Georgoulias K., Chryssolouris G., The Teaching Factory Paradigm: Developments and Outlook.Procedia Manufacturing 2018;23:1-6. DOI: https://doi.org/10.1016/j.promfg.2018.04.029

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Mourtzis, D., Panopoulos, N., Angelopoulos, J., Zygomalas, S., Dimitrakopoulos, G., & Stavropoulos, P. (2021). A hybrid teaching factory model for supporting the educational process in COVID-19 era. Procedia Cirp, 104, 1626-1631.

Nassaji, H. (2015). Qualitative and descriptive research: Data type versus data analysis. Language teaching research, 19(2), 129-132.

Nopilda, L., & Kristiawan, M. (2018). Gerakan Literasi Sekolah Berbasis Pembelajaran Multiliterasi Sebuah Paradigma Pendidikan Abad Ke-21 [The implementation of school literacy based on multiliteracy teaching: A teaching paradigm of 21st century]. JMKSP (Jurnal Manajemen, Kepemimpinan, dan Supervisi Pendidikan), 3(2).

Puslapdik.kemdikbud.go.id, (2021). Diakses pada 28 April 2023, 19.08 dari https://puslapdik.kemdikbud.go.id/project-based-learning-profil-pelajarpancasila-dan-gen-z/

Sugiyono. (2017). Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif, Dan R&D. Bandung: Alfabeta

Vitriani, V., Okmayura, F., Ali, G., & Satria, R. (2023). Teaching Factory Model Using Flipped Classroom and Knowledge Management System Based in Improving 21st Century Competencies in Vocational High Schools. AL-ISHLAH: Jurnal Pendidikan, 15(2), 1347-1356.

Wahjusaputri, Sintha, Elin Marlina, and Siti Latifah. 2020. "Developing the Teaching Factory Learning Media in a Public Vocational High School." Jurnal Pendidikan Vokasi 10(1): 69–79.

Yıldız, E., Doğan, U., Özbay, Ö., & Seferoğlu, S. S. (2022). Flipped classroom in higher education: An investigation of instructor perceptions through the lens of TPACK. *Education and Information Technologies*, *27*(8), 10757–10783.

Yuliani, W. (2018). Metode penelitian deskriptif kualitatif dalam perspektif bimbingan dan konseling. Quanta, 2(2), 83-91.