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Evaluation of the learning implementation of technopreneur profile elements in the subject of fundamentals of fashion skills based on the independent curriculum in Vocational High Schools

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ABSTRACT

This study aims to evaluate the implementation of technopreneur profile element learning in the primary subject of fashion skills based on the independent curriculum at SMK Negeri 1 Wonosari and SMK Negeri 6 Yogyakarta in terms of planning (antecedent), process (transaction), results (output). This research is evaluation research using the Countenance evaluation model of Stake. The study population consisted of 2 teachers and 180 students in phase E of Fashion Design at SMK Negeri 1 Wonosari and SMK Negeri 6 Yogyakarta. Data collection techniques used are documentation and questionnaires. The results showed that: (1) The antecedent aspect of the implementation of technopreneur profile element learning at SMK is in the very good category (100%), planning the flow of learning objectives (ATP) shows the very good category (100%), as well as planning the teaching module shows a very good category (100%); (2) The transaction aspect of the technopreneur profile element of learning at SMK is in a good category (70%), the implementation of learning shows the good category (63%), and the learning assessment shows the good category (43%); (3) The output aspects of the technopreneur profile element of learning at SMK found that students from both schools succeeded in achieving the minimum completeness criteria with a percentage of 100%. Achievement of the learning objectives of the technopreneur profile at SMK Negeri 1 Wonosari & SMK Negeri 6 Yogyakarta was measured by test and non-test assessments.

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INTRODUCTION

Education is crucial for the future success of the younger generation, particularly in preparing middle-level workers through Vocational High Schools (SMK). Vocational education graduates, especially vocational schools, are designed not only to focus on work but also to have other alternatives like working, continuing, and entrepreneurship (Kovalchuk et al., 2023). Since entering school, SMK is expected to create learning that fosters students' motivation and positive attitudes toward entrepreneurship. One thing that can be done to instil entrepreneurial values in students is to improve the curriculum (Tiberius & Weyland, 2024).

The amount of 143,265 schools in Indonesia are implementing Merdeka Curriculum, including the SMK education level. The initial implementation of the independent curriculum in several schools faced challenges as it was a newly executed program. Not all teachers understood the substance of the independent curriculum in terms of content, material, mission, and goals because of its new nature (Sumarsih et al., 2022). In terms of planning learning based on an independent curriculum, teachers need to analyze the components of Learning Objectives (CP), Learning Goals (TP), and the Flow of Learning Goals (ATP). Another classic problem is

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the difficulties that begin when describing the TP of a predetermined CP in practice (Kurniati & Kusumawati, 2023).

On the other hand, the Fashion Design Expertise program focuses on developing practical skills for the clothing sector, aiming to produce graduates ready for the fashion industry and entrepreneurship. Under the independent curriculum, the program outlines specific learning outcomes for Fashion Design students, covering elements like the technopreneur profile, business opportunities (such as fashion design, retail, and merchandising), and various jobs in the fashion sector. In the Basics of Fashion Skills program for Grade X students, learning includes understanding the technopreneur profile, business opportunities, and jobs in the fashion field. It helps students stay updated on industry developments, especially those influenced by technology. Knowing about business trends in fashion, like e-commerce and social media marketing, broadens their perspectives for future endeavours in the fashion industry.

SMK Negeri 6 Yogyakarta and SMK Negeri 1 Wonosari, specializing in Fashion Design, use an independent curriculum. They aim to teach students about technopreneurship, business opportunities, and fashion careers. The goal is to prepare graduates for entrepreneurship. However, a preliminary survey at both schools reveals challenges in teaching these topics within the independent curriculum. The observations at SMK Negeri 1 Wonosari indicate challenges in the ATP (Learning Goal Flow) planning document for teachers instructing the basics of fashion skills, particularly in teaching technopreneur profile elements. Identifying thinking skills aligned with the technopreneur profile elements is challenging. Meanwhile, learning entrepreneurship requires thinking critically to understand concepts by the principles of entrepreneurial activities, such as reading market and business opportunities, identifying business risks, and making business decisions (Baggen et al., 2022). The second problem is that the teaching module documents, especially in designing learning activities, technopreneur profile elements, business opportunities, and jobs/professions in the fashion sector, need to place learning in a realistic or contextual situation. Learning technopreneur profile elements must be contextually designed because they involve many concepts students need to learn realistically or contextually. It aligns with Ratten's presentation (Ratten & Usmanij, 2021) that a contextual learning approach can be applied in analyzing business opportunities.

Entrepreneurial project activities encounter another challenge, a critical component of the learning outcomes connected to technopreneur profile elements. These activities are centered around production tasks, resembling other productive fashion learning approaches. The teacher takes on a dominant role as the project implementer, and student involvement is limited. This approach aims to boost students' confidence and empower them to create innovative and creative products within the fashion sector (Nian et al., 2014). As a result, students have no interest in entrepreneurship. It is in contrast to the characteristics of independent curriculum-based learning, which focuses on the student-centered learning approach, namely emphasizing learning that empowers students to be the center of attention during the learning process. In the SCL approach, students actively involve themselves in learning, which is triggered by intrinsic motivation (Lee & Hannafin, 2016).

Teachers at SMK Negeri 6 Yogyakarta also explained other problems. Learning the elements of the technopreneur profile at SMK Negeri 6 Yogyakarta is more focused on the theoretical level in class. It makes students' critical thinking skills in learning technopreneur profile competence not develop; on the contrary, students more often memorize material. Meanwhile, independent learning emphasizes critical thinking skills rather than memorizing (Fahmi et al., 2022). As a result, students need to be more keen on reading market opportunities when assigned to market the fashion products they produce during productive learning in Phase E. This approach, in contrast to the exposure of Junca in her research (Junça-Silva et al., 2024), highlights the pivotal role of creativity and innovation in solving problems and efforts to take

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advantage of daily opportunities so that an effort is needed to increase the entrepreneurial spirit from an early age.

Technopreneur profile elements, business opportunities, and jobs/professions in fashion (fashion) in learning the basics of fashion skills are essential for fashion students when they continue to the next phase or after graduation. After learning these elements, fashion students are expected to (1) Understand the technopreneur profile, (2) Describe the work or entrepreneurial professions in the fashion industry, (3) Explain the personality and attitudes required for working in the fashion industry, (4) Be able to read market opportunities and businesses in the field of arts and the creative economy to build vision and passion, (5) Engage in project-based learning through authentic projects as a simulation of entrepreneurial projects. Graduates of the fashion skills program who have been provided with insight into technopreneur profiles, business opportunities, and jobs/professions in the clothing (fashion) field since class X will have the opportunity to become entrepreneurs in the fashion sector from a young age, gain experience in starting, running and developing businesses in the fashion sector, clothing by optimizing technology (Hameed & Irfan, 2019). However, in reality, the two schools observed still face some obstacles in incorporating technopreneur profile elements into their learning. In order to meet the expectations for implementing learning elements of technopreneur profile based on the independent curriculum, Vocational High Schools need to ensure thorough planning (antecedent) and processes (transactions) are needed to get good results (output) as expected.

The independent curriculum-based technopreneur profile in SMK focuses on specific elements such as planning lessons, implementing learning, and evaluating learning outcomes. It means the learning system and evaluation of learning outcomes in Vocational Schools must align with the independent curriculum. The planning documents in the Independent Curriculum consist of Learning Objectives Flow (ATP) and Teaching Modules. In this context, the learning process is more oriented to student needs (student center) (Indarta et al., 2022), influencing the materials, approaches, and methods used in learning. Independent curriculum assessments include diagnostic, formative, and summative assessments (Angga et al., 2022).

Teachers can customize learning programs in an independent curriculum according to students' and community needs, enhancing relevance and effectiveness. However, variations in school conditions and teacher capabilities may result in uneven implementation of technopreneur profile learning. Thoroughly examining detailed data on technopreneur profile element learning across various schools is crucial to assess its effectiveness.

Efficient planning, execution, and evaluation of technopreneur profile learning in Fashion Design Vocational Schools can equip students with skills and a mindset conducive to entrepreneurship. Implementing an independent curriculum allows teachers to tailor learning to student needs, context, and environment. Conducting evaluation research is essential to assess the success of technopreneur profile learning in Vocational High Schools, determine if targets were met, and provide insights for further improvements.

Facing various challenges, researchers initiated an in-depth study to evaluate the implementation of technopreneur profile element learning in the basics of fashion expertise based on the independent curriculum at Vocational High Schools, specifically SMK Negeri 1 Wonosari and SMK Negeri 6 Yogyakarta. This study aims to assess: (1) The planning (Antecedent) of technopreneur profile element learning implementation in the basics of clothing expertise based on the independent curriculum at SMK, (2) The process (Transaction) of implementing technopreneur profile element learning in the basics of clothing expertise based on the independent curriculum at SMK, and (3) The results (Output) of implementing technopreneur profile element learning in the basics of clothing expertise based on the independent curriculum at SMK.

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RESEARCH METHOD

This research is evaluation research. The evaluation model used is the Countenance model of Stake. The components of the Countenance Stake evaluation model include antecedents (planning), transactions (processes), and outputs (results). The population in this study were two teachers who teach technopreneur profile elements and 180 students in Phase E of the fashion skills program at SMK Negeri 6 Yogyakarta and SMK Negeri 1 Wonosari. The sample of this research is two teachers and 119 students. The determination of student samples is based on the table of Isaac and Michael by taking the α error rate of 5%. The process of taking student respondents in this study used proportional random sampling.

Data collection methods used in this study are questionnaires and documentation. The research instrument is a non-test instrument consisting of document review sheets and questionnaires. The instruments for the questionnaires are classified into two: those for teachers (Questionary A) and those for students (Questionary B). Proving the validity of the document review sheet instrument and questionnaire A using expert judgment techniques and the Aiken's V Index. The V values for all items on the document review sheet instrument fall within the high category (0.91-1). Meanwhile, the V values for all items in Questionnaire A fall within the very high category (0.62-1).

The validity of questionnaire instrument B uses construct validity, which Exploratory Factor Analysis carries out. The construct validity tests that must be met in EFA include the KMO test (Kaiser Mayer Olkin), the significance value of Barlett's Test of Sphericity, and the Anti-Image Value. The SPSS calculation results indicate a KMO value of 0.741 for questionnaire instrument B, meaning that the sample of 61 students is sufficient and can be further analyzed. The Barlett's Test value is 2273.672, with a significance value 0.000. Then, the anti-image values were reviewed, indicating that all items had MSA values greater than 0.50. The validity test results for questionnaire instrument B showed 46 valid statements.

The ICC formula is used to estimate the reliability of the document review sheet and questionnaire A. The ICC reliability of the document review sheet instrument is 0.818; it can be interpreted that the document review sheet instrument, which consists of 15 items, meets the reliability criteria. ICC reliability on questionnaire instrument A is 0.978; it can be interpreted that questionnaire instrument A, consisting of 46 items, meets the reliability criteria. Cronbach's Alpha coefficient formula was used to estimate the reliability of Questionnaire B. The results of the overall trial analysis showed that the reliability coefficient of the 46 questionnaire items was 0.968, where the figure was > 0.70, indicating that the questionnaire instrument was reliable for measuring process aspects. The data analysis techniques used are descriptive and quantitative.

FINDINGS AND DISCUSSION

Findings

Antecedent Evaluation

Planning aspect data (Antecedent) was obtained through document review sheets with two teacher respondents from both schools seen from the lesson plan, which includes planning the ATP and teaching modules. Based on the results of statistical analysis in Table 1 descriptive obtained N valid as much as 2, mean value of 50, median value of 50, and Std. Deviation of 2.121.

Based on Table 1, the mean value of the learning planning score for the technopreneur profile element in the basics of fashion skills subject is 50 at intervals ≥ 48.75, which means that the tendency of learning planning is included in the "very good" category with a percentage of 100%. Learning planning elements of the technopreneur profile in the basics of fashion skills

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based on the independent curriculum at Vocational High Schools obtained a 100% Very Good percentage. It can be concluded that the implementation of learning the elements of the technopreneur profile based on the independent curriculum in terms of the planning aspect (antecedent) is classified as "Very Good"

Table 1. Antecedent categorization

Score	Frequency	Percentage	Category
≥ 48,75	2	100%	Very Good
37,5 ≤ X < 48,75	0	0	Good
26,25 ≤ X < 37,5	0	0	Not Good
< 26,25	0	0	Poor

The sum of the scores in the learning plan for the technopreneur profile element in the basics of fashion skills subject is obtained from the average score of 2 components in the planning (Antecedent), namely the Planning of Learning Objectives Flow (ATP) and the teaching module competency of the technopreneur profile. However, if we compare the mean score of learning planning with a perfect score, there is a gap of 10. It means several components of learning planning for the technopreneur profile have yet to be planned optimally.

Both SMK Negeri 6 Yogyakarta and SMK Negeri 1 Wonosari face similar challenges in implementing the technopreneur profile in their learning plans based on the Merdeka curriculum. When the independent curriculum was introduced, teachers needed clarification on how to design learning activities for technopreneur profile competencies. SMK Negeri 6 Yogyakarta, in particular, found it challenging to adapt due to differences from the previous curriculum. However, workshops organized by the Ministry of Education and Culture and guidance from pioneer schools helped teachers understand and develop technopreneur profile competencies under the independent curriculum.

Transaction Evaluation

Two groups of respondents received two different types of questionnaires to measure transaction effectiveness. Questionnaire A, with 46 statement items, was distributed to 2 teacher respondents at each SMK. Questionnaire B, with 46 statement items, was distributed to 119 respondents from the 2 SMKs. The results of Questionnaire A will later be matched with the results of Questionnaire B so that a match is obtained regarding the learning process data of the technopreneur profile elements. It is known that N valid of the Questionnaire (see Table 2) A is 2, the mean value is 146, the median value is 146, and Std. Deviation value is 2,82.

Table 2. Transaction categorization (Question A)

Score	Frequency	Percentage	Category
≥ 149,5	0	0%	Very Good
115 ≤ X < 149,5	2	100%	Good
80,5 ≤ X < 115	0	0	Not Good
X < 80,5	0	0	Poor

Table 2 shows the distribution of questionnaire A. The frequency distribution of scores on the process (transaction) aspect tends to score in the good category (100%). Likewise, with an average value of 146 in the interval 115 ≤ X < 149.5, which means that the process aspect (transaction) according to the perception of teacher respondents is classified as "Good" with a percentage of 100%. It means that the indicators for the process aspects of the technopreneur profile elements in learning the basics of fashion skills based on the independent curriculum are often carried out according to the teacher's perception.

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It is known that the average value (Mean) of Questionnaire B on the process aspect is 130.66, and the median value (Median) is 132. Table 3 shows the distribution of questionnaire B. The frequency distribution on the process aspect (transaction) obtains a tendency to score in the very good category (14%), good category (70%), and less good category (16%). So, it can be seen that the average of 130.66 is in the interval $115 \leq X < 149.5$, which means that the process aspect (transaction) according to the perceptions of student respondents is classified as "Good" with a percentage of 70%.

Table 3. Transaction categorization (Question B)

Score	Frequency	Percentage	Category
≥ 149,5	17	14%	Very Good
115 ≤ X < 149,5	83	70%	Good
80,5 ≤ X < 115	19	16%	Not Good
X < 80,5	0	0%	Poor

Overall, based on the analysis of the results of Questionnaire A, the learning implementation activities in SMK show an N value is 2, an average of 132, a median value is 132, and Std. deviation is 1,414. The learning implementation component obtains a score gap of 36 from a perfect score. The same thing happened with Questionnaire B.

The distribution of frequency distribution scores of Questionnaire A on the learning assessment component of Questionnaire A obtained a score trend in the good category (100%). So, it can be seen that the average of 11 is at interval $10 \leq X < 13$, which means that the component of learning assessment according to the perceptions of teacher respondents is classified as "Good" with a percentage (100%). It means the indicators for learning assessment component elements of the technopreneur profile based on the independent curriculum are often carried out according to the teacher's perception.

The spread of Questionnaire B's frequency distribution scores on the learning assessment component of Questionnaire B obtained a tendency for scores in the Very Good (21%), Good (43%), and Poor (36%) categories. So, it can be seen that the average of 10.85 is in the interval $10 \leq X < 13$, which means that the learning assessment component, according to the perceptions of student respondents, is classified as "Good" with a percentage (43%). It means that the indicators for the learning assessment component of the independent curriculum-based technopreneur profile elements are often carried out according to student perceptions.

Output Evaluation

Evaluation of output aspects is obtained based on student achievement of Learning Objectives (TP). Student achievement of TP is seen from the student's success in achieving the criteria for completion. In this case, the criteria that have been determined is the achievement of students' learning completeness in the technopreneur profile learning, namely 75. In this research, it was found that students from both schools succeeded in achieving the minimum completeness criteria with a percentage of 100%. The evaluation of learning output in the Technopreneur Profile at SMK Negeri 1 Wonosari and SMK Negeri 6 Yogyakarta involves both quantitative measurements through tests and qualitative data from non-test results. The assessment covers the achievement of each learning objective.

The measurement of learning goals regarding understanding the Technopreneur Profile is evaluated through tests with multiple choice tests. The students at SMK Negeri 1 Wonosari scoring an average of 85 and those at SMK Negeri 6 Yogyakarta scoring an average of 86. Both schools achieved a 100% completion rate, indicating that all students successfully reached the expected competencies.

The measurement of achieving the learning objective that describes jobs or entrepreneurship professions in the fashion field, evaluated through tests, showed that the

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average score of students at SMK Negeri 1 Wonosari was 86, while students at SMK Negeri 6 Yogyakarta reached an average score of 88. The completion rate of students in both schools reached 100% for this learning objective, indicating that all students in both schools successfully achieved the expected competencies. The score range for students at SMK Negeri 1 Wonosari was in the Very Good (75%) and Good (25%) categories, while the score range for students at SMK Negeri 6 Yogyakarta was in the Very Good (61%) and Good (39%) categories. The students' mastery of fashion industry-related learning objectives indicates their readiness for careers in the field and potential for entrepreneurship.

In terms of personality and attitudes in the fashion industry, SMK Negeri 1 Wonosari students scored an average of 90, while SMK Negeri 6 Yogyakarta students scored an average of 83. Again, both schools achieved a 100% completion rate, showing that students successfully attained the desired competencies. The assessment of learning goals related to reading market opportunities and business in the arts and creative economy is done through non-tests. The non-test evaluation results indicate excellent performance from both schools. SMK Negeri 1 Wonosari students scored an average of 87, and SMK Negeri 6 Yogyakarta students scored an average of 84. This reflects a highly successful implementation of learning, with students demonstrating a deep understanding of reading market opportunities and business in the fashion field. From the non-test results, it can be concluded that both schools have successfully implemented learning well, and students have a deep understanding of reading market and business opportunities in the fashion field.

The evaluation of achieving learning goals through real project-based learning as a simulation of entrepreneurial projects is also assessed through non-tests. The results show very positive achievements from both schools. SMK Negeri 1 Wonosari students scored an average of 88, while SMK Negeri 6 Yogyakarta students scored an average of 90. Both schools achieved high average scores, a 100% completion rate, and a good score range, indicating the success of project-based entrepreneurial learning.

Disccussion

Antecedent Evaluation

The ATP planning component for the technopreneur profile element consists of two indicators: the formulation of Learning Outcomes (CP) and learning objectives. The CP formulation for the technopreneur profile element, prepared by teachers, was categorized as very good, signifying their ability to identify competencies and content within the CP. While the government provides CP, Purba's (2022) research suggests ongoing analysis as CP is dynamic and can be developed beyond the government-provided standards. Confirming this, the researcher assisted teachers in the CP analysis process. Teachers at both schools analyzed and identified essential competencies aligned with students' phases, especially in Phase E of Clothing Design. In this phase, students in Fashion Design at SMK Negeri 6 Yogyakarta closely matched the technopreneur profile CP. The government-provided CP was also deemed crucial for supporting student competence in this area, as indicated by a teacher at SMK Negeri 1 Wonosari.

Upon analyzing the CP, teachers proceed to establish learning objectives for technopreneur profile elements. However, research suggests room for improvement in formulating these objectives. According to Yongbin et al. (2023); Sasha et al. (2022); and Rebecca et al. (2022), learning objectives should encompass competence, content, and variety, with competence referring to expected student abilities, content representing core knowledge, and variety covering necessary thinking skills. While teachers have focused on competence and content, they have often overlooked identifying the essential thinking skills related to technopreneur profile elements. Vocational High School students need various thinking skills like creativity, analytical thinking, and innovation, essential for success in the fashion entrepreneur field. Dewi's insights (Dewi & Wening, 2019) support this, highlighting the

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importance of teachers identifying the right-thinking skills to develop students' entrepreneurial abilities. Therefore, it's crucial for teachers to comprehensively identify the required thinking skills when formulating learning objectives for technopreneur profile elements.

After formulating learning objectives, teachers proceed to arrange the ATP. The ATP prepared by teachers at both schools is a modification of the sample ATP provided by the government. Following Jamaludin's explanation (Jamaludin et al., 2022), teachers can create ATP by designing, developing, and modifying it themselves or by using examples provided by the government. In terms of ATP planning for technopreneur profile elements, it adheres to the principles of ATP preparation, covering CP, TP, and ATP. This implies that the teacher has successfully designed a framework that guides students from the initial stages of learning technopreneur profile elements to the final stage, which involves undertaking entrepreneurial project activities.

Table 4. Antecedent Evaluation Matrix

Description Matrix		Judgement Matrix	
Intens	Observation	Standard	Judgement
ATP The ATP elements of the technopreneur profile made by the teacher must follow the independent curriculum.	Overall, teachers have been able to compile ATP elements of the technopreneur profile with very good 100% achievements following the independent curriculum.	The Learning Objectives Flow (ATP) element of the technopreneur profile will be good if it matches the components/criteria of independent curriculum planning, namely: 1. Formulate CP technopreneur profile elements 2. Formulate TP technopreneur profile elements	The ATP made by the teacher in learning technopreneur profile elements already contains components following the independent curriculum.
Teaching Module The teaching module for the technopreneur profile elements the teacher makes must follow the independent curriculum.	Overall the teacher has been able to compile teaching modules with elements of the technopreneur profile with very good 100% achievements following the independent curriculum.	The teaching module of the technopreneur profile element will be suitable if it follows the independent curriculum planning component, namely: 1. The identity of the teaching module 2. Initial competence 3. Profile of Pancasila students 4. Learning objectives 5. Learning models 6. Learning activities 7. Infrastructure 8. Question lighter 9. Meaningful understanding 10. Diagnostic assessment 11. Formative assessment 12. Enrichment 13. LKPD	Teaching modules in learning technopreneur profile elements already contain components following the independent curriculum. However, several components still need to be optimally structured: learning objectives, learning activities, and meaningful understanding.

Based on these results, Table 4 shows the antecedent evaluation matrix in detail. The teaching module planning component of the technopreneur profile element consists of 13 indicators, namely (1) contains the identity of the teaching module, (2) initial competency formulation, (3) Pancasila student profile design, (4) learning objectives, (5) learning model, (6) learning activities, (7) infrastructure, (8) formulation of triggering questions, (9) meaningful understanding, (10) diagnostic assessment design, (11) formative assessment design, (12) enrichment and remedial activity design, and (13) LKPD . Based on the research results, the teacher has not optimally arranged several indicators in the teaching modules, including indicators of learning objectives, learning activities, and meaningful understanding.

The design of activities in teaching modules still needs to show learning activities that place learning in realistic or contextual situations. The CTL approach emphasizes the

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connection between learning materials and students' real-life contexts (Alfina & Hidayati, 2022). By designing an optimal CTL approach, students can understand the concepts and skills learned to be applied directly in the context of entrepreneurial projects. In this case, the design of learning activities prepared by the teacher is still focused on memorizing concepts and needs to implement activities to connect concepts. It can allow students to have difficulty understanding what they are learning in the real world. Hence, it impacts a need for more motivation and interest in learning elements of the technopreneur profile.

Transaction Evaluation

The learning implementation component consists of 3 indicators, namely the implementation of preliminary activities, core activities, and closing activities. Indicators of the implementation of preliminary activities include (1) Preparing students, (2) Generating student motivation, (3) Conducting apperceptions, (4) Explaining achievements and learning objectives, and (5) Delivering material coverage. However, one indicator has yet to be implemented optimally by the teacher, namely the indicator of apperception. Good apperception can help students gain a better understanding of the world of technopreneurs and increase their motivation, creativity, and innovative thinking. Apperception can be done by presenting videos or triggering questions regarding the material to students (Pratiwi & Osmunda, 2023). In this case, SMK Negeri 6 Yogyakarta often conducts apperception activities by presenting videos on technopreneur profile material and asking trigger questions. However, at SMK Negeri 1 Wonosari, video presentations on apperception activities still need to be carried out.

The indicators for the implementation of core activities include presenting essential material, applying the CTL & 4C Skills approach, utilizing learning models, employing various learning methods, and utilizing learning media. However, teachers have not yet optimally implemented indicators related to the CTL approach, learning models, learning methods, and learning media. Specifically, the application of the CTL approach needs improvement in exploring actual technopreneur field issues and fostering activities that support students' critical thinking processes (Martínez-Gregorio et al., 2021). The application of learning models, especially in field study and activities analyzing market and business opportunities in the fashion sector, also requires optimization. Furthermore, the use of learning methods, particularly in implementing field study methods, needs improvement. Lastly, the utilization of learning media, especially audio and audio-visual media, could be enhanced.

Technopreneur profile learning emphasizes relevant and interactive learning through project activities. The chosen learning model for technopreneur profile elements is Project Based Learning (PjBL), facilitating the implementation of project activities. Teachers employ the Contextual Teaching & Learning (CTL) approach in teaching technopreneur profile elements, ensuring relevance by designing lessons according to the context, environment, and student culture (Marom & Ningrum, 2023). While teachers have implemented these approaches, there is room for improvement to enhance the overall effectiveness of the implementation process.

Based on research findings, the use of the CTL approach falls short in exploring real-world issues and fostering technopreneurial skills effectively. Elements of the technopreneur profile involve analyzing business opportunities and markets, which can be initiated by addressing actual contextual problems (Jardim & Albright, 2021). However, this proactive approach is lacking in the study conducted at SMK Negeri 1 Wonosari, indicating a suboptimal implementation of CTL. This shortfall impedes students' ability to master essential skills in analyzing business opportunities and markets. Improved contextual learning is essential for authentic comprehension and application of concepts (Supena et al., 2021). Teacher interviews confirm the difficulty in contextualizing business and market opportunity materials, particularly within the clothing industry and students' surroundings.

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Technopreneur profile elements prioritize practical learning directly related to real-life scenarios. Activities such as field studies, industry visits, or entrepreneurial simulations outside the classroom can significantly enhance students' understanding (Y. M. Huang et al., 2022; Petersen et al., 2020; Carbone et al., 2020). However, the current implementation of technopreneur profile learning remains predominantly indoors, contradicting the expectation of an independent curriculum that emphasizes learning beyond the classroom (Indarta et al., 2022). As a result, students struggle to connect material related to business and market opportunities in the arts and creative economy with their surroundings. This limitation undermines the comprehensive learning experience intended by the curriculum.

In technopreneur profile learning with the Contextual Teaching & Learning (CTL) approach, students engage in material discussions and are then tasked with presenting their findings to the class. However, at SMK Negeri 1 Wonosari, many students still hesitate to communicate the results of their group discussions due to feelings of embarrassment, lack of confidence, and fear of making mistakes. In this context, the teacher plays a crucial role, and the suboptimal communication indicates that students are not fully active in the technopreneur profile learning process.

Project-Based Learning (PjBL) is a student-centered model that empowers students to express their ideas through projects, fostering creativity (Du & Han, 2016). Students will be directed to work on a project by applying the public learning model to learning the elements of the technopreneur profile. It follows one of the CPs on the technopreneur profile element: students doing real project-based learning as a simulation of an entrepreneurial project.

Each school's project implementation differs, given teachers' freedom to tailor learning to student and environmental conditions. SMK Negeri 1 Wonosari focuses on producing tote bags based on customer orders through the Teaching Factory. In contrast, SMK Negeri 6 Yogyakarta undertakes an entrepreneurial project by manufacturing children's clothing for sale through the TEFA production unit. Both schools collaborate with TEFA in executing their respective projects. Further interviews with SMK Negeri 1 Wonosari teachers reveal that their students' entrepreneurial projects are more production-focused, centering on products ordered by consumers.

Directly involving students in all stages of an entrepreneurial project is crucial for providing hands-on experience in business management and decision-making. However, at SMK Negeri 1 Wonosari, most entrepreneurial project activities are predominantly carried out by teachers, encompassing order reception, project design, and marketing, with students primarily involved in the production process. The limited participation of students in all facets of entrepreneurial projects can result in a superficial understanding and a need for more practical insights into entrepreneurship. Without active involvement, students may perceive their contributions as inconsequential to the project's success.

The technopreneur profile fosters critical thinking skills, necessitating a thorough analysis (Ahamat & Sin, 2022). Teachers play a crucial role in stimulating student interest, employing theoretical and practical approaches (Pedler et al., 2020). Theoretically carried out in class but with meaningful learning. It means that teachers in developing learning can use media and learning methods that prioritize student activity. In both schools, discussions, assignments, and lecture methods are employed for teaching technopreneur profile competencies. Visual media, such as PowerPoint presentations and handouts, as well as audio-visual media, including videos, serve as learning aids. The chosen learning methods aim to provoke student activity. Some research highlights discussion and simulation methods, emphasizing Student-Centered Learning (Moradoff et al., 2021; Hoidn & Reusser, 2020; Matriano, 2020). Sustaining students' enthusiasm requires ensuring that discussion material remains captivating.

Learning media plays a pivotal role in shaping students' motivation and nurturing their entrepreneurial spirit through the technopreneur profiles (Luthfiana, 2022). In the independent curriculum, attention-grabbing and interactive learning media are crucial (Luthfiana, 2022).

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Visual aids like PowerPoint presentations (PPTs) and handouts suit students with visual learning styles. Additionally, audio-visual media is relevant in modern education, aiding in understanding complex concepts (Tuma, 2021; Olagbaju & Popoola, 2020; Bates, 2020). Visual and audio-visual aids enhance students' comprehension, particularly in abstract topics, reflecting teachers' technological proficiency (Oh et al., 2020). Digitalization of learning media is recommended for independent curriculum delivery. However, teachers should explore diverse media to accommodate students' needs and align with technopreneur profile content. In the digital age, digital and online platforms like Augmented Reality (AR), Virtual Reality (VR), and mobile applications are essential for effective learning (K. T. Huang et al., 2019).

The overall implementation of technopreneur profile learning comprises preliminary, core, and closing activities. Despite efforts to adhere to independent curriculum-based learning criteria, the research indicates suboptimal execution. Teachers face challenges in contextualizing material with students' environments, and there is a gap in providing Contextual Teaching & Learning (CTL) and Project Based Learning (PjBL) patterns that effectively connect with technopreneur students and entrepreneurial skills.

Table 5. Transaction Evaluation Matrix

Description Matrix		Judgement Matrix	
Intens	Observation	Standard	Judgement
Implementation of Learning Teachers must carry out learning elements of the technopreneur profile to implement teaching modules according to the independent curriculum.	Overall, the implementation of learning elements of the technopreneur profile obtained a good category according to the independent curriculum with a percentage of 63%.	The learning implementation of the technopreneur profile elements is said to be optimal if it follows the learning implementation standards, which consist of the following stages: 1. Preliminary activities 2. Core Activities 3. Closing activities	The learning implementation of the technopreneur profile elements is good and includes the stages of preliminary, core, and closing activities. However, several components in each stage need to be improved so that learning can be more optimally implemented.
Learning Assessment According to the independent curriculum, teachers must carry out learning assessments of technopreneur profile elements.	Overall the learning assessment of the technopreneur profile elements obtained a good category according to the independent curriculum with a percentage of 43%	The learning assessment of technopreneur profile elements is optimal if it follows the learning assessment standards, which consist of: 1. Diagnostic assessment 2. Formative assessment	The learning assessment of the technopreneur profile elements is good and includes diagnostic and formative assessments. However, several components in each stage need to be improved again so that the implementation of learning assessment can be more optimal.

Learning assessment is pivotal in the independent curriculum, aiding educators, students, and parents in refining future learning strategies (Luthfiana, 2022). Diagnostic assessments at the outset help gauge students' initial abilities and conditions (Nasution, 2022). Teachers effectively utilize diagnostic assessments to identify students' strengths and weaknesses in the technopreneur profile.

Throughout the technopreneur profile learning process, formative assessments are conducted, aligning with the integrated learning process of the independent curriculum (Gerritsen-van Leeuwenkamp et al., 2017). These assessments occur during and after each lesson, employing techniques like written tests, oral tests, and assignments. Integrated assessment principles allow flexibility in timing, type, techniques, criteria, and management of assessment results (van Beek et al., 2020).

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The assessment practices encompass competencies in interrelated domains, including attitudes, knowledge, and skills. The freedom in determining assessment time involves diagnostic assessments at the beginning of learning, formative assessments during learning, and summative assessments at the end of the phase. Furthermore, teachers exercise flexibility in choosing assessment types, opting for non-cognitive assessments at the beginning of learning. The use of appropriate techniques and instruments, such as written tests, oral tests, and assignments, reflects the adaptability in implementing assessments tailored to the unique needs of technopreneur profile learning. Based on these results, Table 5 shows the transaction evaluation matrix in detail.

Output Evaluation

The successful achievement of students in understanding the technopreneur profile, as demonstrated by their test results, aligns with the findings of some research. Study suggests that the acquisition of more entrepreneurial knowledge has the ability to change students' mindset towards having the intention to become technopreneurs (Soomro & Shah, 2020; Mir et al., 2023). Therefore, the positive outcomes observed in our study indicate not only the students' comprehension of entrepreneurial concepts but also their potential inclination towards pursuing technopreneurship as a career path. This underscores the importance of integrating technopreneurship education into the curriculum to foster entrepreneurial mindset and aspirations among students.

Based on the result, the students' mastery of fashion industry-related learning objectives indicates their readiness for careers in the field and potential for entrepreneurship. Yoo et al. (2022) notes the diverse entrepreneurial opportunities in fashion, from launching labels to sustainable brands. This suggests that students can acquire the necessary skills to pursue entrepreneurial ventures in fashion. Thus, combining academic understanding with entrepreneurial prospects offers students a solid foundation for successful careers or ventures in the industry.

Students' knowledge about personality and attitudes in the fashion industry further strengthens their readiness for careers or entrepreneurial endeavors within the field. The fashion industry, known for its emphasis on aesthetics, creativity, and personal expression, also requires a range of personality traits and attitudes. Understanding these traits, in addition to mastering job descriptions and entrepreneurial opportunities, equips students with a comprehensive skill set. This enables them to navigate the complexities of the industry with confidence and adaptability, ensuring they are well-prepared to pursue successful careers or ventures in this dynamic field.

Both schools have successfully implemented learning well, and students have a deep understanding of reading market and business opportunities in the fashion field. The high completion rate and good score range indicate the effectiveness of the independent curriculum in developing students' competencies in the context of entrepreneurship in the fashion industry. This research finding can be associated with the study by Maziriri (2024) that technopreneurship learning has proven to broaden students' insights and business experiences. Students are faced with challenges to generate new ideas and engage in business activities, such as production and online sales through social media.

Evaluation of the achievement of learning objectives through real project-based learning as an entrepreneurial project simulation also shows very positive achievements from the two schools. This aligns with previous research (Hariyanto et al., 2023; Shekarian & Parast, 2021; DeCoito & Briona, 2023) highlighting the effectiveness of project-based learning in enhancing entrepreneurial behavior among students.

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CONCLUSION

The planning (antecedent) element of the technopreneur profile in teaching the basics of fashion expertise at Vocational High Schools, based on the independent curriculum, received a very good category (100%). The evaluation of the process (transaction) aspect of the technopreneur profile in learning the basics of clothing skills based on the independent curriculum at Vocational High Schools is in the good category (70%). The evaluation of the results (output) of the technopreneur profile element in learning the basics of fashion expertise based on the independent curriculum at Vocational High Schools is in the very good category with 100% students pass the criteria.

Conflict of interests

There are no known conflicts of interest associated with this publication.

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