IJORER : International Journal of Recent Educational Research
Homepage : https://journal.ia-education.com/index.php/ijorer
Email : ijorer@ia-education.com

p-ISSN : 2721-852X ; e-ISSN : 2721-7965
IJORER, Vol. 5, No. 2, March 2024
Page 334-344

Optimizing Technical Entrepreneurship: Instrument Development for Assessing Technopreneurial Behavior Among Vocational High School Fashion Design Students

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DOI: https://doi.org/10.46245/ijorer.v5i2.563

Sections Info

Article history:
Submitted: January 6, 2024
Final Revised: February 13, 2024
Accepted: February 15, 2024
Published: March 7, 2024

Keywords:
Fashion Design;
Instrument;
Technopreneur Behavior;
Vocational High School.

ABSTRACT

Objective: Technopreneur behavior refers to the traits, attitudes, and actions of an individual or group involved in technology-based entrepreneurship. Technopreneur is a combination of the word's "technology" and "entrepreneurship," and encompasses the application of technology and innovation in a business context. The purpose of this study is to develop an instrument that can measure the technopreneur behavior of Vocational High School Fashion School students. **Method**: This research is a development research with a 4D model, namely Define, Design, Development, and Development. Instrument was tested on 30 students of Vocational High School 3 Kediri. **Results**: The results of the study stated that based on the CVR, correlation-total, OMS, and IMS criteria, there were 2 items that did not meet so that these items had to be revised or discarded, while other items were declared to meet the criteria. And the results of the instrument trial stated that 3.33% of students had techopreneur behavior in the "high distinction" category, 83.3% in the "Distinction" category, and 13.3% in the "Credit" category. **Novelty**: This research presents novelty by designing a unique instrument that focuses on the technopreneur behavior of VHS Tata Busana students. This innovative approach includes the integration of technological and entrepreneurial aspects, active stakeholder participation, the application of revolutionary learning models, and adaptation to the latest technological developments.

INTRODUCTION

Vocational High Schools are designed to prepare students or graduates who are ready to enter the world of work and are able to develop professional attitudes in their field. With the skills they already have, vocational high school graduates are expected to immediately enter the world of work after completing their education (Fauzi & Widiastuti, 2022; Müller, 2021). However, in reality, the open unemployment rate of graduates Vocational Schools still the highest compared to other educational (Prianto et al., 2020). Data from the Central Statistics Agency in 2023 regarding employment in Indonesia, especially for vocational school graduates, Central Statistics Agency data reports the number of open unemployment rates as of February 2023 as many as 8.40 million people of this number (Irwanto, 2022). States that graduates Vocational School are the most unemployed and vocational school graduates are the largest compared to graduates of other levels of education (Ohara et al., 2020).

Solution provided by Vocational School to minimize the level of open unemployment by launching entrepreneurial activities for graduates Vocational School. According to the graduate profile Vocational School has three main opportunities, namely being able to work straight away, continuing your studies and becoming an entrepreneur (Husna, 2020). Graduate of Vocational School entrepreneurship can be a driver of industrial and economic growth in the country (Raharjo & Ummaya, 2023).

Currently the business world is entering a new era, the fourth industrial revolution (IR 4.0), so the entrepreneurial world must also develop by using high technology in automation, internet use and smart technology. Entrepreneurship carried out by utilizing technology is called technopreneur (Pratiwi et al., 2022). Technopreneurs is carried out by utilizing creativity from the latest technology and innovation to develop business fields commercially (Phuthong, 2023). Technopreneur can be focused on creating technology so that it can be used to increase innovative business opportunities (Djuraeva, 2021). Industry prioritizes technopreneur to be able to compete as society's demands grow. Technopreneur has two aspects, namely the technological aspect and the entrepreneurial aspect (Kadiyono et al., 2019).

In preparing themselves as a technopreneur in the fashion sector, Fashion Design Vocational School students must pay attention to the positive. By having the right technopreneur behavior, students can build a successful and sustainable career in the fashion field (Mantasia & Putri, 2023; Nanda, 2023; Sudarwati & Chalimah, 2022). Instilling technopreneur behavior in Fashion Design Vocational High School students is very important to help students prepare themselves to face challenges in the world of work (Heriyati & Abror, 2023; Suhartini et al., 2020).

There are several technopreneur behaviors that can be applied to prepare yourself as an entrepreneur in the fashion sector, including: Creative and Innovative, Dare to Take Risks, Visionary and Goal Oriented, Able to Adapt Quickly, Focus on Quality and Customer Satisfaction, and Collaborative and Open Regarding Input (Puji et al., 2021). To increase the level of technopreneur behavior in Vocational High School students, this can be done by providing training and direct practical experience in creating new ideas, developing products and services, as well as marketing products and looking for customers. Apart from that, the school environment can also provide support and motivation for students to develop skills and behavior as technopreneurs (Bomani et al., 2021; Bruri et al., 2021; Salhieh & Al-Abdallat, 2022; Soomro & Shah, 2021; Utaminingsih & Anwar, 2023).

The level of technopreneur behavior of Vocational High School students can vary depending on the characteristics of the students, school environment, and previous experiences (Agung & Mashuri, 2022). In determining the level of technopreneur behavior in Fashion Design Vocational High School students, evaluation and observation must be carried out continuously to ensure that students continue to develop positive technopreneur behavior (Ernawati et al., 2023). To determine the level of technopreneur behavior in Fashion Design Vocational High School students, this can be done by observing, interviewing, giving assignments and competitions in the business or fashion sector. So, when choosing a technopreneur behavior instrument, it is necessary to pay attention that the instrument chosen must be able to measure technopreneur behavior comprehensively and accurately (Kaczmarek & Stano, 2023). Apart from that, the instrument must also be adapted to the characteristics of the students, the school environment, and the evaluation objectives to be achieved (Zhao, 2021). In the end, this research presents novelty by designing a unique instrument that focuses on the technopreneur behavior of Fashion Design Vocational School students. This innovative approach includes the integration of technological and entrepreneurial aspects, active stakeholder participation, application of revolutionary learning models, and adaptation to the latest technological developments.

RESEARCH METHOD

This research is development research with a 4-D model. This model was developed by Thiagarajan (1974). The 4D development model consists of 4 main stages, namely: Define, Design, Develop and Disseminate. This method and model were chosen because it aims to produce a product in the form of an instrument to measure the level of technopreneur behavior. The flow of research activities is shown in the Figure 1.

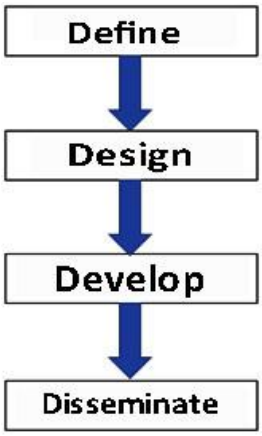

Figure 1. Research flowchart.

The "Define" stage in developing the technopreneur behavior instrument at the Fashion Design Vocational High School includes identifying the needs and objectives of the instrument, as well as an in-depth understanding of student characteristics, the school environment, and the demands of the fashion industry. The "Design" stage in the development of the Clothing Vocational High School technopreneur behavior instrument involves designing the structure and format of the instrument. This includes the preparation of questions and evaluative aspects to ensure the instrument meets the goal of measuring student technopreneur behavior holistically and accurately. The "Development" stage in the development of technopreneur behavior instruments at Fashion Design Vocational High Schools involves making instruments based on designs that have been prepared. This includes instrument item development, testing, and refinement to ensure the validity, reliability, and relevance of the instrument to the technopreneur context in the school. And the "Disseminate" stage in developing the technopreneur behavior instrument for Fashion Design Vocational High Schools involves disseminating the results and instruments to related parties. This process includes conveying information to teachers, students and stakeholders, as well as ensuring broad understanding regarding the use of these instruments in the context of technopreneur in schools.

The research subjects in this development research are Fashion Design students Vocational School Negeri 3 Kediri class XI has 30 students. Instrument product validation was carried out by five experts with expertise in education and fashion and tested on vocational school students. Instrument validation was carried out in three stages, namely instrument content validation using the content validity ratio (CVR) method, item-total correlation and reliability, and item-fit analysis. An instrument is said to be suitable for use if it meets the following requirements: (1) CVR value ≥ 0.30; (2) item-total correlation value ≥ 0.20 and reliability value ≥ 0.60; and (3) infit mean square (IMS) and outfit mean square (OMS) values of 0.50-1.50.

RESULTS AND DISCUSSION

Results

Technopreneur behavior refers to the collection of attitudes, skills and actions applied by a person in carrying out the role of technopreneur. The operational definition and indicators of technopreneur behavior are depicted in Table 1.

Table 1. Operasional definition and technopreneur behavior indicators.

Variables	Dimensions	Operational definition	Indicator	Item No
Technopreneur Behavior	1. Self-confident	Have strong self-confidence, independence from other people, and individualism	Confidence	1-3
			Independence	4-6
			Individualistic	7-8
			Optimism.	9-10
	2. Task and results-oriented	The need for achievement, profit-oriented, strong drive, energetic, persistent and steadfast, determined to work hard and take initiative	Performance	11-13
			Profit oriented	14-15
			Strong push	16-17
			Energetic	18-19
			Persistent	20-21
			Work hard	22-24
			Initiative	25-26
	3. Dare to take risks and like challenges	Able to take reasonable risks.	Dare to take risks	27-31
			Likes challenges	32-33
	4. Leadership	Has a leadership spirit, adapts easily to other people, and is open to suggestions and criticism	Have a mission	34-35
			Able to make strategic planning	36-38
			Have integrity	39-41
			Ability to influence other people	42-43
			Ability to set an example	44-45
			Ability to make decisions	46-47
			Ability to communicate effectively	48-50
			Ability to develop a team	51-53
			Transparency	54-55

Variables	Dimensions	Operational definition	Indicator	Item No
			Goal oriented	56-57
	5. Originality	Innovative, creative and flexible	Innovative	58-59
			Creative	60-62
			Flexible	63-64
	6. Future-oriented	Have a vision and perspective on the future.	Have a vision	65-66
			Have a future perspective	67-68

The instrument validator has carried out content validation on 5 experts who come from lecturers and teachers at Fashion Design Vocational High Schools, with the areas of expertise shown in Table 2.

Table 2. Field of expertise and institutional origin of validators.

No	Areas of expertise	Institutional Origin	Amount
1	Vocational Field	Surabaya State University	1
2	Informatics Engineering	Surabaya State University	1
3	Indonesian	Buduran State Vocational School, Sidoarjo	1
4	Fashion Sector	Buduran State Vocational School, Sidoarjo	1
5	Entrepreneurship Sector	Buduran State Vocational School, Sidoarjo	1
		Number of Validators	**5**

The validation instrument was prepared based on a 1-4 Likert scale. Scale 1 means very bad, scale 2 means not good, scale 3 is good, and scale 4 is very good. This instrument obtained a CVR assessment with a minimum value of 0.8 and a maximum value of 1. The minimum value for CVR is 0.3, so this proves that each item in the nine instruments can be used to measure constructs in research. After validation, the technopreneur behavior questionnaire instrument was declared feasible and could be used for trials with Fashion Design Vocational High School students. Instrument testing was carried out on students at Vocational School 3 Kediri majoring in Fashion Management class XI. The selection of class XI students was based on the consideration that students had received entrepreneurship and digital literacy lessons. Based on the content validity test, item-total correlation and reliability, as well as item fit analysis, Table 3 is compiled to make it easier to conclude which items will be retained and revised/discarded.

Table 3. Item-total, OMS, and IMS correlation results technopreneur behavioral instrument trial.

Items That Do Not Meet Criteria					Conclusion
No. Items	**CVR**	**Item-Total Correlation**	**CSOs**	**STIs**	
3	1	0.65	1.66	1.71	Maintained
9	1	0.34	3.52	3.33	Maintained
12	1	0.29	1.66	1.60	Thrown away
14	1	0.71	1.70	1.71	Maintained
19	0.80	0.51	1.77	1.69	Maintained
20	0.80	0.08	3.31	3.00	Thrown away
21	1	0.32	1.65	1.75	Maintained
28	1	0.79	0.47	0.50	Maintained
31	1	0.14	3.08	2.86	Maintained
42	1	0.29	2.39	2.24	Maintained
64	1	0.85	0.30	0.33	Maintained
65	1	0.83	0.33	0.36	Maintained
66	1	0.81	0.38	0.39	Maintained
67	1	0.72	0.41	0.43	Maintained

Table 4. Item-total correlation results of instrument trials.

Instrument	Number of Items	Item-Total Correlation	Reliability
Technopreneur Behavior	68	0.08 – 0.85	0.9755

Based on the results presented in Table 3, several items do not meet the CVR, total-correlation, OMS, and IMS criteria so these items must be revised or discarded. In the technopreneur behavior instrument there are 2 items, namely items no. 12 and 20. Meanwhile, there are no other items that do not meet the CVR, total-correlation, OMS, and IMS criteria. Thus, it can be concluded that all items can be maintained and used as research instruments. The results of instrument testing on 30 students at Vocational School 3 Kediri can be seen in Table 4.

Table 4. Technopreneur behavior level fashion design vocational high school students.

Category	The number of students	%
High Distinction	1	3.33
Distinction	25	83.33
Credits	4	13.33
File	0	0.00
Total	30	100.00

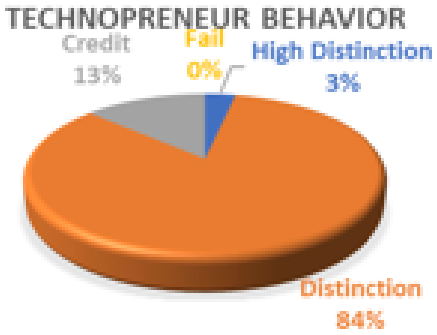

Figure 1. Technopreneur behavior level kediri state vocational high school 3 students.

Based on data obtained using a questionnaire instrument that has been developed, data was obtained that as many as 1 student or 3.33% of students had technopreneur behavior in the "high distinction" category, 25 students or 83.3% in the "Distinction" category, and 4 people students or 13.3% in the "Credit" category.

Discussion

Technopreneur is a term that combines the words "technology" and "entrepreneur" (Oladejo et al., 2022). Therefore, Technopreneur Behavior can be interpreted as a person's readiness to respond consistently to the characteristics of a technology-based entrepreneur (Sengupta et al., 2023). So it can be concluded that the behavior of a technopreneur is the same as the behavior of an entrepreneur (Cahyani & Marcelino, 2022). The dimensions and behavior of technopreneurs are self-confidence, task and results oriented, brave to take risks and like challenges, leadership, originality, and future oriented (Riyanto, 2019). The instrument developed is in the form of a questionnaire, because the questionnaire instrument can investigate the technopreneur behavior of Fashion Design Vocational High School students efficiently, allows data collection from many respondents, and provides clarity and a structural framework in measuring certain aspects of technopreneur behavior (Raharjo & Ummaya, 2023).

The development of instruments to measure technopreneur behavior of Fashion Design Vocational High Schools is an important step in understanding and encouraging entrepreneurial skills and the application of technology in the fashion world (Iliani et al., 2022). This process involves careful consideration of the validity, reliability and contextual accuracy of the instrument (Karpova et al., 2023). The results can provide a holistic picture of the extent to which students can integrate technology and entrepreneurship in the context of fashion design (Lang & Liu, 2019). The instrument development also involved reflection on the dynamics of the fast-changing fashion industry and technological developments. Along with that, this instrument can be an evaluation tool that is responsive to the demands of the times, ensuring that the curriculum and learning at Fashion Design Vocational High Schools are in accordance with the latest developments (Rachmawati & Pahlevi, 2023). As a result of the discussion, the emphasis on the importance of technology integration in the aspects of creativity and entrepreneurship can be a foundation for the further development of the instrument, as well as contribute to the development of technopreneur skills among students of Fashion Design Vocational High Schools (Iliani et al., 2022).

CONCLUSION

Fundamental Findings:(1) The feasibility of the Technopreneur Behavior instrument for Fashion Design Vocational School Students is carried out through validating the contents

of the instrument using the CVR method. In the content validation of the instrument, validated by five validators, 16 items in the instrument were obtained with a CVR value of 1, so this proves that each item in the Technopreneur Behavior instrument can be used to measure constructs in research ; (2) The trial of the Technopreneur Behavior instrument for Fashion Design Vocational School Students was carried out at Vocational School 3 Kediri with 3 class XI Fashion Design students as subjects. Based on the CVR, total-correlation, OMS, and IMS criteria, there are items that do not meet the requirements so these items must be revised or discarded. In the technopreneurship intention instrument there are 2 items, namely items no. 12 and 20. Meanwhile, the other items are stated to meet the CVR, total-correlation, OMS, and IMS criteria. Thus it can be concluded that all items can be maintained and used as research instruments; (3) The results of instrument testing carried out on 30 Kediri State Vocational High School students, stated that 3,33% of students had techopreneur behavior in the "high distinction" category, 83,3% in the "Distinction" category, and 13,3% in the "Credit" category. **Implications**: The development of technopreneur behavior instruments for Fashion Design Vocational School students has significant implications for improving technological skills and entrepreneurial spirit, supporting their preparation to face the challenges of the modern fashion industry. **Limitation**: The developed instrument might focus on specific aspects of technopreneurial behavior, and there may be limitations in comprehensively capturing the multidimensional nature of technopreneurship. This limitation could affect the instrument's ability to provide a holistic assessment. **Future Research:** Future research regarding the development of technopreneur behavior instruments in Fashion Design Vocational Schools needs to explore its impact on students' readiness to face technological trends and entrepreneurial challenges in the fashion industry.

ACKNOWLEDGEMENTS

We would like to thank State University of Surabaya (UNESA) for the support and facilities provided during this research process. Thank you for the guidance, resources, and academic environment that made this research possible. Also, special appreciation to Kediri State Vocational School for providing permission and good cooperation during data collection. Participation and contribution from the school was very significant in completing this research.

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