JISIP (Jurnal Ilmu Sosial dan Pendidikan)
Vol. 10 No. 1 Januari 2026
e-ISSN : 2656-6753, p-ISSN: 2598-9944
DOI: *10.36312/jisip.v10i1.10104/http://ejournal.mandalanursa.org/index.php/JISIP/index*

The Role of Creative Thinking and Entrepreneurial Motivation in Developing Innovative Behavior in Upcycled Denim Design in Vocational High School Students

Lathifaturrohmah[1], Ratna Suhartini[2], Maspiyah[3], I Gusti Putu Asto Buditjahjanto[4]

[1]Pendidikan Teknologi dan Kejuruan, Fakultas Pasca Sarjana, Surabaya State University, Indonesia [2]Pendidikan Vokasi, Fakultas Pasca Sarjana, Surabaya State University, Indonesia
[3]Pendidikan Tata Rias, Fakultas Teknik, Surabaya State University, Indonesia
[4]Teknologi Informatika, Fakultas Teknik, Surabaya State University, Indonesia

Article Info

Article history:
Received: 2 January 2026
Publish: March 2026

Keywords:
Creative Thinking;
Entrepreneurial Motivation;
Innovative behavior Fashion;
Sustainability Upcycle Denim.

Abstract

This research is motivated by the importance of innovative skills in vocational education, especially in sustainable fashion that demands creativity and an entrepreneurial spirit. The purpose of this study is to analyze the influence of creative thinking and entrepreneurial motivation on students' innovative behavior in designing outer upcycle denim at SMKN 6 Surabaya. The study used a quantitative approach with the SEM-PLS method. Instruments in the form of performance tests and questionnaires that have been tested for validity and reliability were given to grade XI Fashion Production Design students. The results showed that creative thinking and entrepreneurial motivation have a positive and significant effect on innovative behavior, with entrepreneurial motivation as the strongest influencing variable. Simultaneously, both variables explain 92.5% of the variation in students' innovative behavior. These findings emphasize the importance of strengthening creative thinking and entrepreneurial motivation in vocational education to produce innovative and independent graduates.

Corresponding Author:
Lathifaturrohmah
Universitas Negeri Surabaya, Indonesia
Email: 24070895004@mhs.unesa.ac.id

1. INTRODUCTION

Vocational education plays a crucial role in preparing students to face the challenges of a dynamic, creative, and innovation-driven workplace. In the era of Industry 4.0 and the creative economy, Vocational High School (SMK) students, particularly those in the Fashion Design program, are faced with the challenge of ensuring graduates are not only technically proficient, but also possess strong creative thinking skills, entrepreneurial motivation, and innovative behavior. This is in line with the demands of the 21st century, where creativity, innovation, and adaptability are key competencies in the development of the creative industry, including in the fashion sector.

One form of learning that can hone students' creativity and innovation is through a

denim upcycle design project. Upcycling, also known as creative reuse, means reusing items as new ones without having to go through a destruction process [1]. Research suggests that integrating sustainability into higher education enhances students' environmental awareness and promotes responsible consumer behavior (Gwilt, 2015) [2]. With high values, this will result in a design that puts waste back into the production chain. Meanwhile, research (Fajarwati, 2025) emphasizes the importance of green entrepreneurship in vocational education that integrates environmental awareness, innovation, and economic independence [3]. This activity not only raises awareness of sustainability issues and textile waste management but also requires students to think critically and creatively in processing ideas into unique and marketable designs.

Sustainability in vocational education is very important, producing a positive impact on students, and its contribution to the transformation of the fashion industry to be more environmentally friendly, this has been proven to increase ecological awareness, responsible consumption, and creativity in design [4]. In the process of creating upcycle denim designs, creative thinking is an important factor because it encourages students to explore new ideas, combine different concepts, and find innovative design solutions from limited materials. Many researchers emphasize the need for complementary cognitive processes, such as critical thinking and convergent thinking, in supporting and enhancing creative thinking. According to Munanadar (2012) creative thinking refers to the ability to observe various possible solutions to a problem [5]. In research Priyono et al., (2024) showed that creativity and learning motivation have a significant influence on the entrepreneurial intentions of vocational school students [6]. including in this case looking for a solution how unused items are upcycled to produce original fashion works and have high aesthetic value.

Although creative thinking skills are an important aspect in the process of creating works, they will not be optimal without the support of entrepreneurial motivation. Motivation is an encouragement to start and develop activities. The presence of motivation is very important in aspects of daily life, because it is the core of regulating biological, cognitive, and social functions (Dunn & Zimmer, 2020). l [7]. According to Suryana (2013) explains that entrepreneurial motivation is a condition within a person that encourages him to carry out entrepreneurial activities creatively and innovatively in order to achieve goals, gain profits, and realize economic independence [8], so there needs to be encouragement to be able to foster students' courage in trying new ideas, taking risks, and developing innovations into products that have economic value. In the study of Yang, J,. et al (2024) found that entrepreneurship education influences student motivation and their business innovation, in the context of vocational education in China [9], while in Reuther et al. (2023) showed that motivation is an important factor in sustainable entrepreneurship including aspects of innovation and creativity [10].

Two aspects, namely creative thinking and entrepreneurial motivation, are believed to play a significant role in shaping students' innovative behavior. According to Wess and Farr, as cited by Helmi (2011), innovative behavior refers to the intention to create, introduce, and implement new ideas within a group or organization, with the aim of improving collective performance [11]. This behavior includes the process of creating and combining new things, both in the form of products and services, which can provide added value socially and economically, thus reflecting an individual's ability to explore, develop, and implement new ideas into real practice. In vocational education learning upcycle in fashion design, innovative behavior is evident in students' abilities to design, process and utilize denim materials, and present design results with a new approach that is original and

relevant to trends. However, in practice, many vocational high school students still experience difficulties in developing design ideas, especially creative upcycle products, and lack the motivation to turn their work into business opportunities. This indicates that creative thinking skills and entrepreneurial motivation need to be strengthened to encourage the emergence of more optimal innovative behavior.

Based on the above description, this study aims to measure how creative thinking and entrepreneurial motivation play a role and influence the innovative behavior of vocational high school students in the upcycle denim design process. This study aims to explain the mechanisms and magnitude of their influence—partially and simultaneously. The hypotheses formulated in this study are:

H1. Creative thinking skills influence innovative behavior in vocational high school students in upcycle denim design.

H2. Entrepreneurial motivation influences innovative behavior in vocational high school students in upcycle denim design.

H3. Creative thinking and entrepreneurial motivation simultaneously influence innovative behavior in upcycle denim design in vocational high school students.

2. RESEARCH METHODS

Quantitative research in the educational domain has a central role in measuring and analyzing various educational phenomena using numerical and statistical data (Elvinaro Ardianto, 2011) [12], in line with Sugiyono (2013) quantitative research is research based on the philosophy of positivism, used to research the natural conditions of objects [13]. This research uses a quantitative approach with an ex post facto design. This design was chosen because this study does not provide any treatment to students, but examines the cause-effect relationships that have occurred based on the results of learning that has been passed by students in class X. From this explanation, this study uses a quantitative design to test hypotheses using accurate statistical data tests. The study aims to determine the extent to which creative thinking (X1) and entrepreneurial motivation (X2) play a role in developing innovative behavior in upcycle denim design (Y) in vocational high school students, without manipulating variables.

This study was conducted on 104 eleventh-grade Fashion Production Design students at SMKN 6 Surabaya, using performance tests and questionnaires as data collection techniques. The aim was to determine the role of creative thinking and entrepreneurial motivation in students' innovative behavior. The data collected consisted of a questionnaire instrument using a Likert scale assessment, while the performance test referred to a previously validated performance test assessment rubric. This study focuses on analyzing the contribution of creative thinking and entrepreneurial motivation to students' innovative behavior in facing the needs of industry 4.0.

3. RESULTS AND DISCUSSION

The data for this study were obtained through two data collection techniques, namely performance tests and questionnaires given to all respondents. The performance test was used to assess students' cognitive abilities in aspects directly measured through the practice of outer upcycle design, while the questionnaire was used to collect data regarding perceptions and attitudes towards creative thinking and entrepreneurial motivation variables related to the objectives of this study. The instruments were distributed to 104 students in the Fashion Production Design 3 class, SMKN 6 Surabaya, which were then analyzed using Structural Equation Modeling based on Partial Least Squares (SEM-PLS),

a statistical approach used to analyze complex relationships between latent variables measured through a number of indicators. The stages in the SEM-PLS analysis consist of the outer model testing stage and the inner model testing stage (Hair et al; 2019) [14].

3.1. Research Results

The results of the research on the creative thinking variable instrument (X1) which refers to 4 dimensions, namely fluency, flexibility, originality and elaboration, and is measured using 22 indicators, each of which reflects the ability to think creatively in generating ideas, producing new ideas, producing unique ideas and being able to explain ideas in detail.

Table 4.1 Data on Instrument Scores for Creative Thinking Variables

Creative Thinking	Mean	Median	Standart Deviation (STDEV)	Min	Max
X1.1	2.961	3.000	1.379	1.000	5.000
X1. 2	3.275	4.000	1.373	1.000	5.000
X1. 3	2.833	3.000	1.172	1.000	5.000
X1. 4	2.922	3.000	1.384	1.000	5.000
X1. 5	3.059	3.000	1.378	1.000	5.000
X1. 6	2.804	3.000	1.291	1.000	5.000
X1. 7	3.049	3.000	1.301	1.000	5.000
X1. 8	3.039	3.000	1.306	1.000	5.000
X1. 9	3.039	3.000	1.328	1.000	5.000
X1. 10	2.961	3.000	1.379	1.000	5.000
X1. 11	2.912	3.000	1.261	1.000	5.000
X1. 12	2.784	3.000	1.250	1.000	5.000
X1. 13	3.245	4.000	1.389	1.000	5.000
X1. 14	2.559	2.000	1.125	1.000	5.000
X1. 15	2.755	3.000	1.324	1.000	5.000
X1. 16	2.784	3.000	1.318	1.000	5.000
X1. 17	2.941	3.000	1.297	1.000	5.000
X1. 18	2.824	3.000	1.256	1.000	5.000
X1. 19	2.735	3.000	1.252	1.000	5.000
X1. 20	2.706	3.000	1.209	1.000	5.000
X1. 21	2.696	3.000	1.305	1.000	5.000
X1. 22	2.941	3.000	1.364	1.000	5.000

Source: processed data (2025)

The average value of the creative thinking indicators ranged from 2.559 to 3.309, indicating that students' perceptions were in the fair to good category. The highest indicator (X1.2) indicated students' strengths in creating attractive and functional designs, while the lowest indicator (X1.14) indicated weaknesses in combining ideas from two pairs of denim pants for upcycling. The median value, which was generally around 3, indicated stable perceptions, with some indicators reaching a median of 4,

reflecting a better ability to consider design function and technology adaptation. Overall, although there was variation in creative thinking abilities among students, the majority showed positive assessments, but there was still a need to strengthen the exploration of ideas and design experiments through teacher guidance. The standard deviation value of the indicators ranged from 1.125 to 1.384, indicating a moderate variation in students' perceptions of creative thinking abilities. In general, students' creative thinking abilities were quite good, but still needed to be strengthened in several aspects to improve the quality of the design process and results.

The results of the research on the entrepreneurial motivation variable instrument (X1) which refers to 6 dimensions, namely orientation towards achievement, risk, responsibility, feedback, internal locus of control and independence and is measured using 16 indicators, each of which reflects entrepreneurial motivation in determining clear goals and targets, being able to face work risks, being responsible, accepting criticism and evaluation to being independent in making a decision.

Table 4.2 Instrument Score Data for Entrepreneurial Motivation Variables

Entrepreneur Motivation	Mean	Median	Standart Deviation (STDEV)	Min	Max
X2.1	2.745	3.000	1.304	1.000	5.000
X2. 2	3.069	4.000	1.381	1.000	5.000
X2. 3	3.245	4.000	1.472	1.000	5.000
X2. 4	3.441	4.000	1.525	1.000	5.000
X2. 5	2.912	3.000	1.476	1.000	5.000
X2. 6	3.412	4.000	1.478	1.000	5.000
X2. 7	3.235	4.000	1.359	1.000	5.000
X2. 8	3.520	4.000	1.619	1.000	5.000
X2. 9	2.657	2.000	1.233	1.000	5.000
X2. 10	3.343	4.000	1.531	1.000	5.000
X2. 11	2.971	3.000	1.346	1.000	5.000
X2. 12	2.931	3.000	1.395	1.000	5.000
X2. 13	2.863	3.000	1.329	1.000	5.000
X2.14	3.186	4.000	1.433	1.000	5.000
X2. 15	2.775	3.000	1.260	1.000	5.000
X2.16	3.245	4.000	1.458	1.000	5.000

Source: processed data (2025)

The average value of the entrepreneurial motivation indicator ranges from 2.657 to 3.520, indicating a fair to good category. The median, which is generally around 3–4, indicates relatively stable student perceptions, although there is quite a wide variation in motivation among students. The indicator with the highest average value (X2.8) indicates student satisfaction in achieving goals through self-effort, while the lowest indicator (X2.9) indicates a low level of courage to take risks and readiness to face challenges. The standard deviation value, which ranges from 1.233 to 1.619, indicates a significant difference in motivation levels among students. In general, Creative Products and Entrepreneurship learning has been able to foster entrepreneurial motivation, but teacher guidance is still needed to strengthen aspects

of perseverance, self- confidence, and readiness to face entrepreneurial challenges.

The next stage, the inner model (structural model) test, is used to evaluate the relationships between latent constructs in the research model and ensure that the PLS model to be estimated to test the relationships between research variables fits the analyzed data, so that the sample used can explain the actual population conditions. This testing stage includes several stages, the first of which can be seen from the R-Square value. In the analysis of the inner model (structural model), R-Square (R^2) is used to assess how effective and robust it is in predicting the dependent variable.

Table 4.3 R-*Square* Value

Variabel Dependen	R-*Square*	Kriteria
Perilaku Inovatif	0,925	Moderate

Source: processed data (2025)

Based on the results of data processing in the table above, the R2 value = 0.925. This can be interpreted that the model is able to explain the phenomenon of Innovative Behavior which is influenced by the independent variables of self-efficacy, creative thinking, and entrepreneurial motivation with a variance value of 92.5%. While the remaining 16% is explained by other variables outside this study. In PLS analysis, after the model is proven to fit, testing the influence between variables can be carried out. Based on the results of the PLS model estimation using the bootstrapping method for 104 samples, the results of testing the influence between variables are as follows.

Table 4.4 Path Coefficients Results

Path	Original Sampel	Mean (M)	Standart Deviation (STDEV)	T-Statistics	P-Values	Hipotesis	Kesimpulan
Berpikir Kreatif (X2) □ Perilaku Inovatif (Y)	0,345	0,350	0,126	2,736	0,003	H2	*Supported*
Motivasi Wirausaha (X3) □ Perilaku Inovatif (Y)	0,347	0,336	0,145	2,386	0,009	H3	*Supported*

Source: processed data (2025)

Based on the results of the path coefficient analysis in the table above, the following results were obtained:

a. Creative Thinking (X1) □ Innovative Behavior (Y)

The analysis results show that creative thinking has a significant effect on innovative behavior. This result is demonstrated by the path coefficient value of 0.345, indicating a positive relationship. This means that the higher the students'

creative thinking skills, the higher their tendency to demonstrate innovative behavior in the process of designing upcycled denim outerwear. Furthermore, the T-statistic value of 2.736 is greater than the Z- value (α = 0.05 (5%) = 1.96), strengthening the evidence for this effect. The p-value of 0.003 is less than 0.05. This confirms that the influence of creative thinking on innovative behavior is statistically significant.

b. Entrepreneurial motivation (X2) □ Innovative Behavior (Y)
Entrepreneurial motivation has a significant effect on innovative behavior. This result is indicated by the path coefficient value of 0.347, which indicates a positive influence and is almost as strong as the creative thinking variable. In addition, the T-Statistic value of 2.386 is greater than the Z value α = 0.05 (5%) = 1.96, so the relationship is declared statistically significant. This is also supported by the p-value of 0.009, which is below 0.05. Thus, it can be concluded that entrepreneurial motivation has a significant effect on students' innovative behavior. The higher the students' interest and drive for entrepreneurship, the greater their desire to produce innovative and useful designs.

3.2. Discussion

Hypothesis testing in this study was carried out by referring to the results of the analysis using SEM-PLS, the following is a summary of the results of the hypothesis testing process in this study.

a. There is an influence of the role of creative thinking skills on innovative behavior in vocational high school students in upcycle denim design. The results of the analysis show that creative thinking has a significant effect on innovative behavior, so that hypothesis H1 is accepted. The ability to generate original, flexible, and varied ideas plays an important role in improving students' innovative behavior, especially in upcycle denim design projects. This finding confirms that creative thinking is the foundation of innovative behavior. Students with high creative thinking skills tend to be more daring in exploring ideas, experimenting, and developing functional and aesthetic designs. This is supported by the path coefficient value of 0.345, which indicates that creative thinking is a key factor in encouraging students' innovative behavior.

b. There is an influence of entrepreneurial motivation on innovative behavior in vocational high school students in upcycled denim design. The results of SEM-PLS testing indicate that entrepreneurial motivation has a positive and significant effect on innovative behavior, so that hypothesis H2 is accepted. Entrepreneurial motivation encourages students to produce creative, functional, and marketable upcycled denim outer designs. This finding emphasizes achievement motivation as a driver of innovation. The upcycled denim project provides students with the opportunity to see opportunities for sustainable fashion products, thus influencing innovative attitudes in design development and material selection. This also confirms that entrepreneurship education and entrepreneurial motivation strengthen students' innovative behavior. Thus, entrepreneurial motivation is an important factor in fostering innovative behavior in vocational high school students who are creative, utility-oriented, and ready to become independent entrepreneurs.

c. There is a simultaneous influence of creative thinking and entrepreneurial motivation on innovative behavior in upcycled denim design in vocational high school students. The results of the SEM-PLS analysis show that creative thinking and entrepreneurial motivation simultaneously have a very strong influence on students' innovative

behavior in upcycled denim outer design, with a contribution of 92.5%. Entrepreneurial motivation is the variable with the highest influence, followed by creative thinking as the foundation for developing design ideas and innovation. This finding confirms that the synergy of creativity and entrepreneurial drive increases students' ability to produce innovative, functional, and economically valuable upcycled denim designs, and can be the basis for developing project-based learning and entrepreneurship in vocational education.

4. CONCLUSION

Creative thinking and entrepreneurial motivation have a positive and significant influence on students' innovative behavior. Entrepreneurial motivation has the highest contribution as an internal driver in producing original and marketable work, while creative thinking serves as the foundation for developing design ideas and solutions. Simultaneously, both variables make a very strong contribution to innovative behavior, indicating that student innovation is the result of a synergy between creative thinking skills and entrepreneurial drive. These findings confirm that developing innovative behavior in vocational education requires learning that integrates creativity and entrepreneurship.

5. ACKNOWLEDGMENTS

The author would like to express his gratitude to all parties who have provided support and assistance in the process of compiling the research entitled "The Role of Creative Thinking and Entrepreneurial Motivation in Developing Innovative Behavior of Denim Upcycle Design in Vocational High School Students." Special thanks are extended to SMKN 6 Surabaya, the 11th grade Fashion Production Design students, the accompanying teachers, and all parties who have contributed to the implementation of this research. Hopefully the results of this research can provide benefits in developing teaching materials that are in accordance with the needs of the 4.0 era industry.

6. BIBLIOGRAPHY

[1] McDonough, W., & Braungart, M. (2002). *Cradle to Cradle: Remaking the Way We Make Things*. North Point Press

[2] Gwilt A, 2015, 'Exploring a Framework for fashion Design for Sustainability', in *Handbook of Sustainable Apparel Production*, CRC Press, pp. 439-452, http://dx.doi.org/10.1201/b18428-26

[3] Fajarwati R. M. (2025). *Green Entrepreneurship Sebagai Pilar Pendidikan Kejuruan : Inovasi Untuk Kemandirian Ekonomi dan Kelestarian Lingkungan.* https://doi.org/10.36636/dialektika.v10i2.5375

[4] Tahalele, Yoanita. (2020). *Analisa Produk Fesyen Berkelanjutan: Tantangan Dan Penentu Keberhasilan. Seminar Nasional Envisi 2020 : Industri Kreatif.*

[5] Munandar, U.(2012). Pengembangan Kreativitas Anak Berbakat. Jakarta: Rineka Cipta.

[6] Priyono, P., Agung, A. I., Buditjahjanto, I. P., Anifah, L., & Agfianto, T. (2024). *The influence of creativity and learning motivation on entrepreneurial intentions of fisheries vocational high school students. Jurnal Pendidikan Vokasi, 14*(1). https://doi.org/10.21831/jpv.v14i1.69869

[7] Dunn, J,C & Chantele, Z,. (2020). Self Determination Theory. London : Rouledge

[8] Suryana. (2013). *Kewirausahaan: Kiat dan Proses Menuju Sukses*. Salemba Empat

[9] Yang, J., Liu, . Y., Arifani, Y., & Junaidi, J. (2024). The Influence of Entrepreneurial

Education on Students' Business Innovation and Motivation. *International Journal of Learning, Teaching and Educational Research*, *23*(11), 268–286. https://www.ijlter.net/index.php/ijlter/article/view/2126

[10] Reuther, K., Dahle, Y., Schmidt, C., & Schosser, F. (2023). Motivational Facets of Sustainable Entrepreneurship : A Systematic Review and Future Research Agenda. https://doi.org/10.3390/su15032272

[11] Helmi, A, F. (2011). Model Determinan Perilaku Inovatif pada Mahasiswa yang Berwirausaha. 38(2). 134 – 146.

[12] Ardianto, Elvinaro. 2011. Metodologi Penelitian Untuk Public Relations Kuantitatif Dan Kualitatif. Bandung: Simbiosa rekatama media.

[13] Sugiyono. 2019. Statistik Untuk Penelitian. Bandung: Alfabeta.

[14] Hair, J. F. et. al. 2019. *Partial Least Squares Structural Equation ModelingBased Discrete Choice Modeling: An Illustration In Modeling Retailer Choice. Business Research.* 12(1) : 115-142