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Perspective of Family and School: Environment Influences Technopreneur Behaviour of Vocational School Students

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ABSTRACT

Objective: This study investigates the influence of family and school environments on developing technopreneur behavior among vocational school students in East Java, Indonesia. The research aims to determine the extent to which these two factors contribute to fostering students' entrepreneurial skills in technology-driven businesses. **Method:** The research employs an ex post facto design, utilizing Structural Equation Modeling (SEM) to analyze data collected from 396 Fashion Design Skills program students. Data were gathered through tests and questionnaires, measuring students' technopreneur behavior, family environment, and school environment. Instrument validation was conducted using the Content Validity Ratio (CVR), item-total correlation, and Rasch model analysis. **Results:** The findings reveal that family and school environments significantly influence technopreneur behavior among vocational students. The family environment contributes 29.1%, while the school environment contributes 44.9% to developing technopreneur behavior. The combined influence of both factors explains 75.5% of the variation in students' technopreneur behavior. The study underscores the importance of supportive families and conducive school environments in fostering entrepreneurial mindsets among students. **Novelty:** This study provides empirical evidence on the combined role of family and school in shaping technopreneur behavior among vocational students, emphasizing the need for an integrated approach to entrepreneurship education. It highlights the importance of strategic curriculum design, teacher training, and family engagement in developing future technopreneurs.

INTRODUCTION

Technopreneurship is increasingly recognized as a crucial aspect of industrial growth, particularly in the fashion sector. Entrepreneurship serves as a significant driver of economic development by fostering job creation and encouraging graduates to adopt an entrepreneurial mindset (Maheshwari et al., 2023). The rapid advancement of technology has reshaped business landscapes, highlighting the necessity for technopreneurs who can seamlessly integrate technological innovations into entrepreneurial practices (Saphira et al., 2023; Saphira & Prahani, 2022). The effective integration of digital technology has become a key determinant of entrepreneurial success in the current era (Tarmizi et al., 2023). Additionally, technopreneurs play a pivotal role in fostering sustainable product innovation by leveraging consumer behavior insights (Bhardwaj, 2020).

Despite the growing attention on technopreneurship, research has primarily focused on entrepreneurial education, digital transformation, and technological adoption in general business settings (Alkhoori et al., 2021; Khodor et al., 2024). However, limited studies have explored the role of environmental factors—particularly family and school environments—in shaping technopreneurial behavior among

vocational school students. The existing literature predominantly discusses the importance of entrepreneurship education but lacks a comprehensive analysis of how these two environments contribute to technopreneurial mindset formation (Kruachottikul et al., 2023; Prahani et al., 2022). Infrastructure remains a significant challenge in fostering students' entrepreneurial attitudes, yet the interaction between personal motivation, environmental support, and digital competency in vocational settings is still underexplored (Wibowo & Sulartopo, 2022).

To address this research gap, this study investigates how the family and school environments influence the development of technopreneurial behavior among vocational school students in the fashion sector. While previous studies have acknowledged the role of digital technology and entrepreneurship education separately, this research uniquely integrates both aspects by examining how external environmental factors shape students' ability to adapt to technological innovations in entrepreneurship (Abas et al., 2023; Komariah & Nihayah, 2023). Additionally, this study provides empirical insights into how students' backgrounds impact their motivation to develop technopreneurial skills, an area that has not been thoroughly examined in the context of vocational education in Indonesia (Nugraha et al., 2022; Nurlailah & Ardiansyah, 2022).

The novelty of this research lies in its comprehensive approach to understanding technopreneurial development through the lens of environmental influence. Unlike previous studies that focused solely on entrepreneurship education or digital technology adoption, this study uniquely examines the combined effect of family and school environments on technopreneurial behavior. By analyzing these factors in the context of Fashion Design Vocational Schools in East Java, this research contributes to a more holistic understanding of how technopreneurial skills can be fostered within specific educational and cultural settings. The findings provide strategic recommendations for curriculum enhancement, teacher training, and family engagement to better equip students for the dynamic demands of the industrial world.

This research aims to determine the role of the family and school environments in shaping the technopreneurial behavior of vocational school students. Through an in-depth analysis of these factors, this study offers valuable insights for curriculum development and policy-making to strengthen technopreneurship education. By equipping students with the necessary mindset and skills, schools can better prepare them to navigate the evolving industrial landscape.

Based on the refined research objectives, the following hypotheses are proposed:

H1 : The family environment significantly and positively affects the technopreneurial behavior of vocational school students.

H2 : The school environment significantly and positively affects the technopreneurial behavior of vocational school students.

H3 : The family and school environments simultaneously have a significant positive effect on technopreneurial behavior.

RESEARCH METHOD

The research design uses the Explanatory research. The explanatory research approach is explained as a method used to identify the causal factors behind an observed phenomenon, as well as explaining how these variables interact and influence each other (Creswell, 2013).

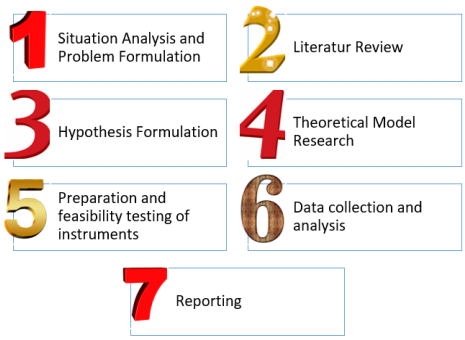

Figure 1. Reseach Procedure

In this research to examine the causal relationships between family environment, school environment and technopreneur behavior. The research conceptualization can be seen in Figure 1.

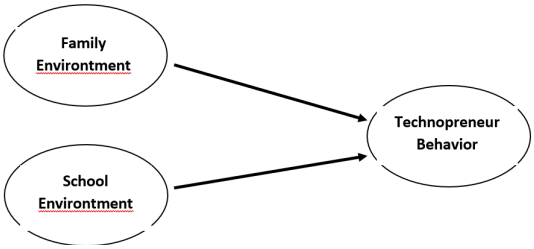

Figure 2. Conceptualization of research variables.

Participant (Subject) Characteristics

This research involved vocational school students in the Fashion Design Skills program in the 2022/2023 academic year in East Java, Indonesia. The research population was 43,940 students (datapokok.ditpsmk, 2022). The sample was obtained using the Slovin formula with a margin of error of 5%, resulting in 396 students. The distribution of students based on research areas can be seen in Table 1.

Table 1. Distribution of research samples.

No	Regency/City	Vocational Schools	Student
1	Sumenep	2	40
2	Magetan	1	20
3	Mojokerto	1	20
4	Bojonegoro	2	40
5	Sidoarjo	1	20
6	Situbondo	1	20
7	Lumajang	2	40
8	Malang	1`	16
9	Malang City	1	20
10	Jombang	1	20
11	Lamongan	1	20
12	Tuban	1	20
13	Surabaya	1	20
14	Pasuruan	1	20
15	Probolinggo	1	20
16	Ngawi	1	20
17	Pacitan	1	20
	Total	**19**	**396**

Data Collection Technique

The data collection techniques in this research are divided into tests and questionnaires. The test was carried out to obtain data on Technopreneur Behavior, while questionnaires were used to obtain data on school and family environment variables.

Research Instruments

Table 2 provides a detailed overview of the research instruments used to measure the influence of both the family and school environments on the Technopreneur Behavior of vocational school students. These instruments include structured questionnaires, interviews, and observational methods designed to assess students' perceptions, experiences, and behavioral tendencies related to technopreneurship. By analyzing data collected through these instruments, the study aims to determine the extent to which family support and school facilities contribute to shaping students' entrepreneurial mindset and engagement in technology-based business initiatives.

Table 2. Instrument Research

Variable	Dimension	Indicator
Technopreneur Behavior	1. Business Plan 2. Marketing 3. Innovation	Company Logo, Key partners, Key activities, Value proportions, Customer relationship, Channels, Customer segments, Cost Structure, Revenue sources, Product Description, Price, Promotion, Market plan, Design Production I and Design Production II.
Family environment	1. Personal Growth 2. Quality of interpersonal relationship 3. System Maintenance	Independent, Achievement orientation, Intellectual-cultural orientation, Active-recreational activities, Moral, religious emphasis, Cohesion, Expressiveness, Conflict, Organization, Control, Wealth, Power, Honor, Education
School environment	1. Physical environment 2. Social environment 3. Academic environment	Learning atmosphere, · Learning infrastructure, learning resources, learning media, Relationships with friends, Relationships with teachers, Relationships with school staff, Teaching and learning activities, Extracurricular activities

Data analysis

Content validity is assessed using the Content Validity Ratio (CVR), which ranges from -1 to 1 for each item. A higher CVR indicates stronger content validity. A positive CVR suggests that at least half of the validators deem the item essential for the construct. According to Lawshe (1975), the minimum acceptable CVR value depends on the number of experts involved, with a general threshold often set at 0.3 for practical applications. Ayre & Scally (2014) further refined Lawshe's method, emphasizing its role in ensuring rigorous validation of test items.

Item Correlation – Totals and Reliability

Reliability was assessed using item-total correlation and Cronbach's alpha. Item-total correlations indicate each item's contribution to the instrument's consistency by distinguishing between high- and low-scoring individuals (Nunnally & Bernstein,

1994). Items with an item-total correlation score of ≥ 0.2 are generally considered acceptable (DeVellis, 2012).

Cronbach's alpha measures the internal consistency of a group of items by assessing their homogeneity. The values range from 0 to 1, where a value of 0.6–0.7 is considered acceptable, and ≥ 0.8 indicates excellent reliability (George & Mallery, 2003). However, a Cronbach's alpha value exceeding 0.95 may suggest redundancy in the items rather than a desirable level of reliability (Tavakol & Dennick, 2011).

Analysis Fit-Item

Data analysis was based on respondents' answers using item response theory (IRT) with Rasch modeling. The infit mean square (IMS) and outfit mean square (OMS) values are referenced in instrument measurements. The IMS and OMS values used in this research are 0.5 – 1.5, as shown in Table 3.

Table 3. The mean square value and its implications for measurement

No	Mean square value	Implications Measurement
1	> 2.0	Tampering with measurements
2	1.5 – 2.0	Not valid for measurement but not detrimental
3	0.5 – 1.5	Useful for measurements
4	< 0.5	Not valid for measurement but not detrimental

Hypothesis Test Analysis

Research hypothesis testing was carried out using the Structural Equation Model (SEM) approach. SEM is a statistical study that can test a series of relatively difficult-to-measure relationships simultaneously. It is a multivariate analysis technique combining factor analysis and regression analysis (correlation). It aims to test the relationship between variables in a model, whether between indicators and their constructs or between constructs.

RESULTS AND DISCUSSION

Results

Instrument Content Validity

Five experts in vocational engineering, information engineering, Indonesian language, fashion design, and entrepreneurship validated the instrument's contents. The instrument validation results are displayed in Table 4.

Table 4. CVR values for each instrument.

Instrument	Items	Value CVR Min	Value CVR Max
Technopreneur Behavior	16	1	1
School environment	28	0.8	1
Family environment	38	0.8	1

Based on Table 4, the CVR values range from a minimum of 0.8 to a maximum of 1, indicating a high level of validity for the research instruments. The minimum CVR value of 0.8 confirms that each item in the nine research instruments meets the required validity threshold, ensuring that they are appropriate for measuring the intended constructs. This high validity suggests that the instruments effectively capture the influence of family and school environments on students' Technopreneur Behavior, providing reliable data for the study's analysis.

Item-Total Correlation and Reliability

The results of the item-total correlation and test reliability of the instrument are shown in Table 5.

Table 5. Item-Total correlation results of instrument trials.

Instrument	Items	Item-Total Correlation	Reliability	Items That Do Not Meet Criteria
Technopreneur Behavior	16	0.24 – 0.69	0.7769	i15
School environment	28	0.17 – 0.88	0.9044	i4
Family environment	38	0.02 – 0.68	0.8208	i10, i14, i20, i21, i27, i28, i29, i30, i31, i33, i35, i36, i37, i38

The results of the item-total correlation and test reliability of the research instrument, as presented in Table 5, indicate the overall consistency and validity of the measurement tools. The Technopreneur Behavior instrument consists of 16 items, with item-total correlation values ranging from 0.24 to 0.69 and a reliability coefficient of 0.7769, where item i15 does not meet the criteria. The School Environment instrument includes 28 items, showing item-total correlation values between 0.17 and 0.88, with a reliability coefficient of 0.9044, and item i4 failing to meet the criteria. The Family Environment instrument, consisting of 38 items, has correlation values ranging from 0.02 to 0.68, with a reliability coefficient of 0.8208, and 14 items (i10, i14, i20, i21, i27, i28, i29, i30, i31, i33, i35, i36, i37, and i38) that do not meet the criteria. These results suggest that while most items in the instruments are valid and reliable, certain items may need to be revised or removed to improve the overall effectiveness of the measurement tools.

Fit-Item Analysis

Fit-item analysis was carried out on test instruments and questionnaires using the Rasch Model with the help of ConQuest software. Values that are useful in the fit-item analysis are the outfit value (unweighted MNSQ) and the infit value (weighted MNSQ) are 0.5 – 1.5. Outfit and infit analysis results for each instrument category are displayed in Table 6.

Table 6. OMS and IMS instrument trials.

Instrument	Items	OMS	IMS	Items That Do Not Meet Criteria
Technopreneur Behavior	16	0,33 – 2,23	0,37 -2,21	i1, i10, i12, i15
School environment	28	0,32 – 3,07	0,30 – 2,58	i1, i4, i7, i10, i12, i13, i24
Family environment	38	0,59 – 2,36	0,59 – 2,25	i31, i32

Based on the content validity test, item-total correlation and reliability, and item fit analysis, Table 7 is compiled to make it easier to conclude which items will be retained and revised/discarded. Table 7 shows Item-Total Correlation Results, OMS, and IMS Instrument Trials.

Table 7. Item-total, OMS, and STI instrument test correlations.

Instrument	Items That Do Not Meet Criteria					Description
	No. Items	CVR	Correlation Item-Total	OMS	IMS	
Technopreneur Behavior	1	1	0.5547	0.38	0.40	Maintained
	10	1	0.6915	2.23	2.21	Maintained
	11	1	0.6233	1.40	1.53	Maintained
	12	1	0.5956	1.68	1.76	Maintained
	15	1	0.2435	0.33	0.37	Not Maintained
School environment	1	1	0.8015	0.41	0.40	Maintained
	4	1	0.1792	1.85	1.67	Not Maintained
	5	1	0.4490	1.64	1.52	Maintained
	7	1	0.3457	1.83	1.74	Maintained
	10	1	0.6146	0.45	0.44	Maintained
	12	1	0.4000	2.03	1.79	Maintained
	13	0.8	0.4255	3.07	2.58	Maintained
	17	1	0.3508	1.73	1.53	Maintained
	24	1	0.8816	0.32	0.30	Maintained
Family environment	10	1	0.2009	1.14	1.13	Maintained
	14	1	0.2598	1.02	1.04	Maintained
	20	1	0.2282	1.58	1.58	Maintained
	21	1	0.2049	1.01	1.01	Maintained
	27	0.8	0.2037	1.21	1.16	Maintained
	28	1	0.0654	0.92	0.88	Maintained
	29	1	0.2514	0.79	0.79	Maintained
	30	0.8	0.1504	0.69	0.69	Maintained
	31	0.8	0.2476	2.09	2.10	Not Maintained
	32	0.8	0.3743	2.36	2.25	Maintained
	33	1	0.1160	1.29	1.31	Maintained
	35	0.8	0.0946	1.54	1.52	Maintained
	36	1	0.1867	0.86	0.86	Maintained
	37	1	0.0258	0.90	0.87	Maintained
	38	1	0.0898	1.03	1.02	Maintained

Based on Table 7, several items do not meet the CVR, total correlation, OMS, and IMS criteria, so these items must be discarded. Thus, all items can be maintained and used as research instruments.

Validity and Reliability

Table 8. Construct reliability and validity.

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Family environment	0.89	0.89	0.92	0.75
School environment	0.91	0.91	0.94	0.85
Technopreneur Behavior	0.95	0.95	0.97	0.91

The greater the AVE value, the higher the ability to explain the value of the indicators that measure the variable (Ghozali, 2014). In the table above, the AVE values for all variables are in the range 0.75 -0.91. Construct AVE value > 0.50. It was concluded that in this study, all variables met validity standards, so they were declared valid instruments. Several indicators whose outer loading values were removed from the measurement model showed that all indicators had values above 0.70. This shows that all indicators have met the required validity criteria.

Discriminant Validity

Table 9. Fornell-Larcker criterion.

	Family Environment	School Environment	Technopreneur Behavior
Family Environment	0.86		
School Environment	0.76	0.92	
Technopreneur Behavior	0.80	0.82	0.95

The Fornell-Larcker Criterion method compares the squared value of each variable's Average Variance Extracted (AVE) with the correlation between other variables (Henseler et al., 2015). Suppose the square root value of AVE for each variable is greater than the correlation between the variable and other variables in the model. In that case, the model is said to have good discriminant validity (Wong, 2013). Based on the table above shows that the square root value of the variable AVE is greater than the variable coefficient with other variables. It can be concluded that the variable values in this PLS model have met the requirements for discriminant validity.

Table 10. Cross loading.

	Family Environment	School Environment	Technopreneur Behavior
Business Model Canvas	0.79	0.81	0.96
Product Prototype	0.75	0.78	0.95
Marketing Plan	0.76	0.78	0.95
Academic Environment	0.68	0.90	0.72
Physical Environment	0.69	0.92	0.77
Social Environment	0.72	0.94	0.78
Personal Growth	0.90	0.72	0.75
Quality of interpersonal relationship	0.86	0.67	0.70
SES	0.87	0.66	0.71
System maintenance	0.83	0.58	0.61

Based on Table 10, a high cross-loading can indicate a discriminant validity problem, indicating that the indicator does not differentiate between different variables. According to Hair et al. (2021), each indicator should have the highest loading on the measured variable and lower on other variables to meet the requirements for discriminant validity. The cross-loading value of each variable is evaluated to ensure that the variable's correlation with the measurement items is more significant than other variables. The Cross loadings value is expected to exceed 0.7 (Ghozali & Latan, 2015).

Reliability Test

Researchers use Cronbach's Alpha, which must be greater than 0.70, in the reliability test. Table 11 shows the reliability test results.

Table 11. Reliability test.

Item	Cronbach's Alpha
Family environment	0.89
School environment	0.91
Technopreneur Behavior	0.95

In the reliability test, researchers use Cronbach's Alpha, which must be greater than 0.70. The table above shows that the Cronbach's Alpha value for each variable is more than 0.70, so it can be concluded that all variables are said to be reliable.

Hypothesis Testing

Table 12. Hypothesis testing.

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Family environment -> Technopreneur Behavior	0.41	0.41	0.07	5.47	0.00
School environment -> Technopreneur Behavior	0.51	0.51	0.06	7.61	0.00

Hypothesis 1 (H1) There is a direct positive influence between the family environment and the technopreneur behavior of vocational school students. The table above shows the influence of the family environment on Technopreneur Behavior. The p-value is obtained (0.00) with a path coefficient of 0.41. So, the family environment directly and significantly positively affects Technopreneur Behavior. Hypothesis 2 (H2) There is a direct positive influence between the school environment and the technopreneur behavior of vocational school students. The table above shows the influence of the school environment on Technopreneur Behavior. The p-value is obtained (0.00) with a path coefficient of 0.51. So, the school environment directly and significantly positively affects Technopreneur Behavior. Hypothesis 3 (H3) shows a simultaneous positive influence between the family and school environments on technopreneur behavior. The family environment and school environment simultaneously have an influence of 0.75 on Technopreneur Behavior, so it can be concluded that the family environment and school environment have a direct and simultaneous positive influence on the Technopreneur Behavior of Vocational School Students.

F-Square and R-Square

F-Square and R-Square are presentations of values that show how much influence each variable has on Technopreneur behavior. The results of the analysis are in Table 13.

Table 13. F-Square and R-Square.

Item	Description	Value
F Square	Family Environment => Technopreneur Behavior	0.29
	School Environment => Technopreneur Behavior	0.44
R Square	R Square	0.75
	R Square Adjusted	0.75

In Table 13, the F-Square value of the family environment has a partial effect of 29.10% on technopreneur behavior, and the school environment has a partial impact of 44.90% on technopreneur behavior. The R-Square value of technopreneur behavior is 0.87, illustrating that the family and school environment variables correlate or contribute to explaining the technopreneur behavior variable by 75.50%.

Discussion

The family environment plays a critical role in shaping students' Technopreneur Behavior, acting as a primary source of socialization and support for entrepreneurial intentions. According to Social Cognitive Theory (Bandura, 1986), individuals develop behaviors through observational learning and social reinforcement. In this context, a supportive family environment fosters technopreneurial skills by providing exposure to entrepreneurial activities, financial backing, and encouragement to take risks in business ventures. Thominathan et al. (2023) highlight that family background and support moderate students' entrepreneurial intentions, reinforcing the idea that a strong entrepreneurial culture within the family positively influences students' inclination toward technopreneurship. Additionally, Gholamrezai et al. (2021) emphasize that the family environment significantly contributes to shaping entrepreneurial mindsets, as parents' experiences, values, and expectations shape students' entrepreneurial self-efficacy.

The school environment also plays a vital role in fostering Technopreneur Behavior by providing students with relevant knowledge, skills, and exposure to entrepreneurial opportunities. The Theory of Planned Behavior (Ajzen, 1991) suggests that an individual's intention to engage in a particular behavior is influenced by three key factors: attitude toward the behavior, subjective norms, and perceived behavioral control. A conducive school environment, which includes adequate facilities, practical learning experiences, and an entrepreneurship-oriented curriculum, enhances students' attitudes and self-confidence in pursuing technopreneurial activities. Koe et al. (2021) state that educational institutions must integrate entrepreneurship into the curriculum and provide appropriate infrastructure to support entrepreneurial development. Schools can also foster students' interest in technopreneurship by facilitating business exhibitions, competitions, and startup incubation programs. This aligns with Bomani et al. (2021) and Saphira et al. (2022), who argue that an educational institution's vision, mission, and strategic goals should include a focus on technology and entrepreneurship to create a sustainable entrepreneurial ecosystem.

The interaction between family and school environments further strengthens students' Technopreneur Behavior, as both factors provide complementary support. Kaur & Chawla (2024) emphasize that schools, parents, and policymakers play a collective role in designing entrepreneurial curricula and interventions that enhance students' business competencies. The synergy between a strong family support system and a school environment rich in entrepreneurial exposure creates an ideal ecosystem for fostering technopreneurial skills. This aligns with the Entrepreneurial Event Model (Shapero & Sokol, 1982), which suggests that individuals are likely to pursue entrepreneurship when they perceive it as both feasible and desirable. When students receive consistent motivation, access to resources, and practical learning experiences, they are more likely to develop entrepreneurial self-efficacy and engage in technopreneurship.

Furthermore, Mashapure et al. (2023) highlight that environmental, psychological, and sociological factors play a crucial role in developing entrepreneurial capabilities.

The psychological factor includes students' self-confidence and risk-taking abilities, which are shaped by family encouragement and school-based entrepreneurial training. The sociological factor refers to peer influence, mentorship, and networking opportunities within the school environment, which further enhance students' business acumen and innovation potential.

These relationships demonstrate that family and school environments directly and simultaneously influence students' Technopreneur Behavior, with each factor reinforcing the other. Strengthening the collaborative role of families, educational institutions, and policymakers is essential in producing competent and innovative young technopreneurs. A well-structured entrepreneurial ecosystem, supported by educational interventions and family encouragement, ensures that vocational school students are well-equipped to explore technology-based entrepreneurial opportunities and contribute to economic development.

CONCLUSION

Fundamental Findings: This study confirms that family and school environments significantly influence the technopreneurial behavior of vocational high school students in the Fashion Design Skills program in East Java, Indonesia. The family environment has a direct positive impact on students' entrepreneurial tendencies to their technopreneurial behavior. Meanwhile, the school environment plays an even more substantial role. Together, these two factors explain the variations in students' technopreneurial behavior. These findings emphasize the need for a supportive family background and an academic environment fostering students' creativity, innovation, and entrepreneurial skills. **Implications:** The results of this study provide valuable insights for educators, policymakers, and families. Schools should integrate technopreneurship-focused curricula, provide access to modern learning resources, and encourage hands-on projects that simulate real-world business challenges. Teachers should be trained to foster an entrepreneurial mindset in students. Additionally, parents should actively nurture their children's entrepreneurial ambitions by offering guidance, motivation, and exposure to business opportunities. These combined efforts will strengthen the development of young technopreneurs ready to compete in the evolving digital and creative industries. **Limitations:** While this study provides significant findings, there are some limitations. First, the research is limited to vocational high school students in the Fashion Design program, making it difficult to generalize the results to students from other fields. Second, the study focuses only on family and school environments. In contrast, other external factors, such as government policies, digital infrastructure, and peer influence, may also shape technopreneurial behavior. Lastly, the study relies on self-reported data, which may be subject to response bias. **Future Research:** Future research should expand the scope of this study by including students from other vocational disciplines to determine whether similar patterns exist. Additionally, longitudinal studies could be conducted to track students' technopreneurial development over time. Further investigations should also explore the role of government initiatives, digital resources, and peer networks in fostering technopreneurship. Finally, integrating qualitative research methods, such as in-depth interviews with students and educators, could provide a deeper understanding of the challenges and motivations behind students' technopreneurial journeys.

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