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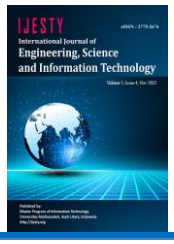

A Systematic Literature Review of Technopreneur Ship Fashion Design

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Abstract

The fashion industry requires Technopreneur fashion design to face the challenges of the technology and digitalization era in preparation for the 5.0 industrial age. Entrepreneurship dimensions, namely autonomy, innovativeness, risk-taking, proactive, and technology proficiency, are confident insufficient for Technopreneur ship due to their limited resources and lack of knowledge and access to foreign Technopreneur ship in fashion design. This study identifies and reviews the literature on Technopreneur ship orientation fashion education in Scopus between 2010 and 2025. This study identifies and reviews literature on technopreneurs' orientation from scientific domains: entrepreneurial dimensions and entrepreneur-based technology drivers in fashion design. A systematic approach was adopted, recognizing 25 relevant articles from published journals indexed by Scopus collected from 2010 to 2025. The lack of literature on the technopreneur dimension has resulted in 10 dominant and representative articles originating from Scopus indexed journals and other related journals indexed by Google Scholar collected from 2002-2025. This study consists of two essential parts: 1) descriptive analysis, discussing the characteristics of the related articles, the country of the study, and the methods used. 2) thematic analysis, discussing the six essential categories of drivers in the adoption of technopreneurship and more deeply. The results regarding creating future ideas mean the same as autonomy, business innovation is innovation in the entrepreneurial dimension, seeking opportunities means being proactive, creating new businesses means the same as risk-taking, and technological proficiency are common expressions from several literatures regarding views on technopreneurship itself that do not originate from the entrepreneurial orientation that exists in the previous literature. This study proposes a conceptual framework of technopreneur orientation in fashion design education to develop a sustainable fashion design curriculum in the future.

Keywords: *Entrepreneur, Technopreneur Orientation, Technopreneur Fashion Framework, Fashion Design Education.*

1. Introduction

The Fast-fashion phenomenon has become a global trend of world globalization in the apparel industry. Speedy supply chain cycles in consumption and production, resulting in this complex problem continuing to roll [1]. Apparel industry activities have referred to the acceleration of the SDGs to implement green supply chains for current business operations [2] with sustainability initiatives with technological innovation strategies [3]. Entrepreneurial researchers have paid attention to developing a better understanding of sustainable business practices through technology. Technology provides good and significant advantages in terms of speed, flexibility, minimizing risk, increasing trust, increasing efficiency, and playing a role in environmental sustainability [4][5]. Entrepreneurial researchers have paid attention to developing a better understanding of sustainable business practices through technology. Therefore, technology and digitalization in the apparel industry bring economic challenges and opportunities [6].

However, traditional business education responds to an uncertain environment; creativity, proactive, and risk-taking programs [7]. The entrepreneurial dimension has autonomy, innovation, proactiveness, competitive aggressiveness, and risk-taking [8][9]. The preliminary study stated that alumni of fashion education graduates need more qualified technological capabilities to meet the current needs of the apparel industry [10][11].

Technopreneur orientation integrated into all fields will create a competent future generation with the ability to innovate business with technology [12][13] and ready to face industry 5.0. Then the apparel industry needs technopreneurs in the fashion sector. However, fashion technopreneurs, especially fashion design, are reported to be very minimal [10][14]. Previous research explained that the scientific learning model of Technopreneur ship is one alternative to produce graduates who are ready to survive in society by applying technology-based entrepreneurial skills. Academic education in fashion majors should allow students to see the latest developments in business strategies, thus providing a clear view for implementing it in future business [15][16]. Therefore, this study aims to develop a better theo-

retical understanding of how entrepreneur dimensions will be integrated into technopreneur orientations and then relate to technical proficiency. The study adopts the systematic literature review framework proposed by [17]. The present review identifies (potentially) different drivers of technopreneur ship in fashion design education. This article is structured as follows: first, constructed a preliminary conceptual framework of drivers of technopreneur ships, and then the systematic literature review approach is introduced. Furthermore, the literature is summarized in a conceptual model, and the contribution is highlighted in the conclusion. Finally, a plan for further research is presented based on gaps identified in the literature.

2. Literature Review

It is essential to establish what kind of entrepreneur dimensions various authors consider technopreneur orientation. Then, the discussion in this section more specifically delves to do a fashion business based on technology. The main thing is the entrepreneurial dimension based on technology, entrepreneurship, technology proficiency, creating future ideas looking for opportunities, and developing new business [18][19][20].

2.1. Defining Entrepreneurial Orientation

Entrepreneurship develops a business unit that builds an individual business unit and a corporate employee who also has an entrepreneurial spirit because the practice consistently turns good ideas into profitable commercial ventures. The essence of entrepreneurship is the consistency of business/ work, innovation of ideas, and promising results [21]. The entrepreneurial orientation is innovativeness, proactiveness, competitive advantages, and risk-taking [22][23].

2.2. Defining Technopreneur ship

Technopreneur is an entrepreneur involved in technology-based industries creating innovative products, business skills, and creativity through commercialization [6]. Technopreneur ship generates creativity so that in the future, it can excel in competing in increasing competitiveness by aligning needs and technology with the entrepreneurial element in the technology sector concerning potential entrepreneurial opportunities in technological development to produce innovative products [24][25]. Technopreneur ship is very important today in the challenges of globalization and economic liberalization due to the effective optimization of human resources [26]. Factors in the development of technopreneurs include technology-savvy, level, quality of education, risk tendency, innovation. Moreover, the things that support the technopreneur ship process are leadership and teamwork, rooted in perception technology solutions, flexibility with solution digitization, focus on innovations and new solutions to social and economic challenges, disciplines, strategies in determining the options to achieve business goals and objectives [27][28].

3. Methods

Systematic literature review research is a method for capturing a knowledge point at specific points [17]. It improves new insights narratively. It started by considering the relevance of scientific articles from 2010 to 2025. According to Nayak, the apparel industry needs skilled operators to adopt new technology, which is currently still very limited [29]. Several studies explain the lack of literacy regarding technopreneur orientation. Thus, it is essential to conduct a systematic literature review regarding the clarity of research theory by prioritizing transparency and improving internal validity. This study identifies keywords related to the research questions used in this study. The relevant literature is on entrepreneur orientation, entrepreneur education, entrepreneur dimension, entrepreneur-based technology, and technopreneur orientation. Entrepreneur orientation was chosen first because it has become one of the most established research constructs in the entrepreneurial literature characterized by its dimensions Entrepreneur [30]. A summary of how the articles in this study were identified is provided in table 1.

Table 1. Distribution of Entrepreneurial and Technopreneur Dimensions

String 1	*Process*	*Details*	*No of articles*	*String 2*	*Process*	*Details*	*No of articles*
Stage 1	Extraction criteria 1	-Language of Paper: English -Year of publication: from 2010 to 2021 -Keywords: Entrepreneurial	798	Stage 1	Keyword search	-Language of paper: English -Year of publication: from 2010 to 2021 - Keyword: Entrepreneur-based technology	452
Stage 2	Extraction criteria 2	Keywords used in search space of title and abstract of entrepreneur dimension, entrepreneur education and entrepreneur orientation	212	Stage 2	Extraction criteria 1	Keywords used in search space of title and abstract of technology entrepreneur, entrepreneur technology-based, and technology dimension	200
Stage 3	Extraction criteria 3	Use of subject filters of entrepreneur dimensions: autonomy, innovativeness, proactiveness, risk-taking, competitive advantages and creativity, abstract analysis	120	Stage 3	Extraction criteria 2	Use of subject filters of entrepreneur dimensions: entrepreneurship, technology proficiency, create future ideas, business innovation, seeks the opportunities and create new business, abstract analysis	75
Stage 4	Extraction crite-	Source titles Entrepreneurial orienta-	68	Stage 4	Extraction cri-	Analyze the similarity of meaning of technopreneur orientation,	30

	ria 4	tion Quartile 1 Scopus, Full paper analysis			teria 4	paper full analysis	
Stage 5	Extrac-tion crite-ria 5	Source titles Entrepreneurial orienta-tion Quartile 1 Scopus, Full analysis of repre-sentatives' paper	15	Stage 5	Extrac-tion cri-teria 5	Analyze the similarity of meaning of technopreneur orientation, Quartile 1 Scopus and 4 paper google scholar indexed high cited and related, total 10 paper full analysis	10

4. Results and Discussion

This study consists of two essential parts: 1) descriptive analysis, discussing the characteristics of the related articles, the country of the study, and the methods used. 2) thematic analysis, discussing the six essential categories of drivers in the adoption of technopreneurship and more deeply. This study compares and summarizes the drivers identified in technopreneurship orientation in fashion design. Next, the driver determines and categorizes based on general terms used in the literature. The drivers are summarized in table 1.

4.1. Descriptive Analysis

The trend of fluctuations in the data seems to vary, as provided in figure 1. Fewer than ten articles were published from 2010-2025. Furthermore, data analysis was carried out according to the method in this study by filtering the data. As shown from the quantitative analysis data collected through literature review, it was found to be the most popular approach among 11 articles. The quantitative analysis of data was collected via a survey among the seven articles as shown in figure 1. Analyzing qualitative data through case studies (3 articles), and the use of secondary data (two articles), mixed methods (one article), and literature review (one article). Further analysis showed that the quantitative design was often chosen to study the phenomenon (11 articles), followed by a qualitative method of 11 articles and a combination of qualitative and quantitative design; respectively, two articles. From these findings, it can be concluded that in 15 articles on entrepreneurial orientation and entrepreneur dimension. The conceptual approach is the most widely used (17 articles). The country distribution is shown in Figure 2.

4.2. Thematic Analysis

Technopreneur is an entrepreneur involved in technology-based industries creating innovative products, business skills, and creativity through commercialization include technology-savvy, level, quality of education, risk tendency, innovation. It's is linked with the digital era. Technopreneurship generates creativity and translate such technology into successful products or services, it can excel in competing in increasing competitiveness by aligning needs and technology with the entrepreneurial element in the technology sector concerning potential entrepreneurial opportunities in technological development to produce innovative products [6]. Technopreneurship is very important today in the challenges of globalization and economic liberalization due to the effective optimization of human resources [31].

Table 2. Entrepreneur orientation dimension's part 1

Author	Year	Country of research	Citation count	Journal	Publisher
GT Lumpkin, GG Dess	2015	U USA	72	Entrepreneurship Theory and Practice	Wiley-Blackwell
J.G Covin	2011	Georgia	1211	Entrepreneurship theory and practice	Sage
A Rauch	2010	Australia	3971	Entrepreneurship Theory and Practice	Sage
D Kariv, A Fayolle	2019	France	11	Journal of small business management	Taylor & Francis
Sirelkhati M and Gangi	2015	India	168	Cogent Business & Management	Taylor & Francis
C. Jones	2010	Australia	142	Journal of small business and enterprise development	Emerald
BS Anderson	2014	USA	599	Strategic Management Journal	John Wiley and Sons Ltd
Piperopoulos	2015	UK	593	Journal of small business management	Taylor &Francis
Bolton	2012	USA	556	Education+ Training	Emerald
L DiVito	2017	Netherlands	93	Journal of Business Venturing	Elsevier
Gawel	2012	Poland	40	Poznan University of Economics Review	Research gate
CS Sung	2018	Korea	37	Sustainability	MDPI
Wongmuek	2018	Thailand	3	International Humanities, Social Sciences and arts	Silpakorn Universit
Marniati	2020	Indonesia	1	International Journal of Fashion Design	Taylor & Francis
Yijun Lv	2021	China	1	Frontiers Psychology	Frontiers Media S.A.

The above is a search for entrepreneur dimensions arranged into a table of articles sequentially based on author, year, country of research, citation, count, and journal publisher.

Table 3. Entrepreneur orientation dimension's part 2

Author	*Autonomy*	*Innovativeness*	*Proactiveness*	*Competitive Advantages*	*Risk-taking*	*Creativity*
GT Lumpkin, GG Dess	x	x	x	x	x	
J.G Covin		x	x	x	x	
A Rauch		x	x		x	
D Kariv, A Fayolle	x	x	x		x	
Sirelkhati M and Gangi	x	x	x	x	x	x
C. Jones			x		x	x
BS Anderson		x	x		x	
Piperopoulos				x	x	x
Bolton		x	x		x	
L DiVito		x	x		x	
Gawel		x	x		x	
CS Sung		x	x		x	
Wongmuek	x	x	x	x	x	
Marniati		x			x	x
Yijun Lv		x			x	

Dimensions about entrepreneur orientation are formulated from the personal perspective of the technopreneur. The dimensions of entrepreneur orientations are autonomy, innovativeness, proactiveness, competitive advantages, risk-taking and creativity.

Table 4. Technopreneur orientation dimension's part 1

Author	Year	Country of research	Citation count	Journal	Publisher
Bhardwaj 2020	2020	India	4	International Journal of Emerging Markets	Emerald
Bahadur Ali Soomro	2021	Pakistan	1	World Journal of Entrepreneurship	Emerald
Zhou, K.Z	2010	Georgia	1233	Journal of Marketing	American Marketing Association
Barr	2010	UK	291	Academy of Management Learning & Education	George Washington University
Oakey	2013	USA	97	International Small Business Journal	Sage
Mishra	2011	Poland	18	Entrepreneurship Research Journal	De Gruyter
K Kleine	2019	Korea	13	Journal of small business management	Wiley
Fowosire	2017	Nigeria	26	The Global Journal of Research in Engineering	Engineeringresearch.org
Selvarani.A	2015	India	15	Journal Impact Factor	Academia.edu
Cezar Scarlat	2014	Rumania	13	FAIMA Business & Management Journal	ProQuest

The above is a search for technopreneur dimensions arranged into a table of articles sequentially based on author, year, country of research, citation, count, and journal publisher.

Tabel 5. Technopreneur orientation dimension's part 2

Author	Entrepreneurship	Technology Proficiency	Create Future Idea	Business Innovation	Risk-taking	Seeking the opportunity
Bhardwaj	x	x	x	x	x	
Bahadur Ali Soomro	x	x		x	x	x
Zhou, K. Z	x	x		x	x	x
Barr	x	x	x	x	x	
Oakey	x	x	x	x	x	x
Mishra			x	x	x	x
K Kleine	x	x			x	
Fowosire				x	x	x
Selvarani. A		x	x		x	
Cezar Scarlat		x	x		x	

Dimensions about entrepreneur orientation are formulated from the personal perspective of the technopreneur. Consequently, the other five categories of dimension, namely, entrepreneurship, technology proficiency, create a future idea, business innovation, risk taking, and seek the opportunity are considered technopreneur orientation dimensions.

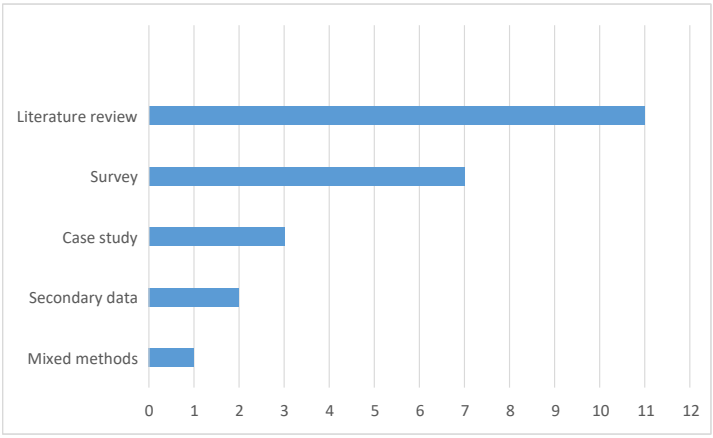

Fig 1. Distribution of Types of Data

Data was analyzed using the method described in this study, which involved filtering the data. According to the quantitative analysis data gathered through a literature review, it was found to be the most popular approach among 11 articles, analyzing qualitative data using case studies (3 articles), secondary data (two articles), mixed methods (one article), and a literature review (one article). Further analysis revealed that quantitative design was often chosen to study the phenomenon (11 articles), followed by a qualitative method (11 articles) and a combination of qualitative and quantitative design (two articles).

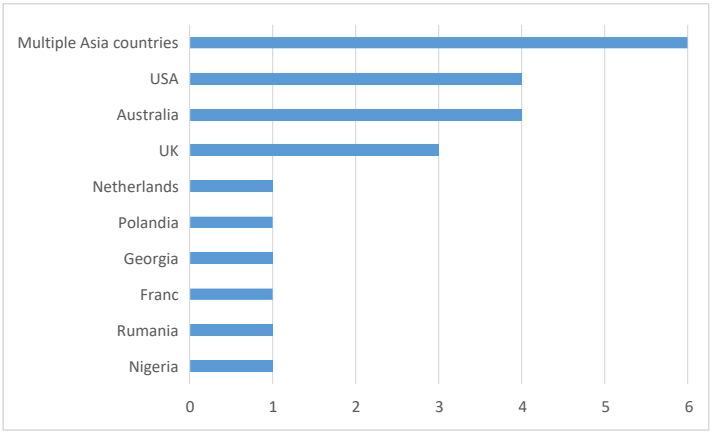

Fig 2. Distribution by Countries

Based on these data graphics, it can be determined that in 15 articles on entrepreneurial orientation and the entrepreneur dimension. The conceptual approach is the most frequently used (17 articles). Figure 2 depicts the countries' distribution.

4.3 Dimensions of Entrepreneur

There are several opinions regarding the dimensions of the entrepreneur. It includes the five dimensions of EO: autonomy, innovation, proactiveness, competitive aggressiveness, and risk-taking [21][32]. These five dimensions by Dess and Lumpkin make EO a more operational concept. Autonomy is understood as the independent action of people aiming to discover a business vision or as the ability to direct oneself in search of market opportunities. Innovative describes the novelty of ideas, experiments, creative processes to develop new products, services, and technologies used. Proactive is understanding as efforts made to achieve profit and lead the market. It can anticipate future needs, which emerged mainly with independence in seeing future business opportunities. Competitive aggressiveness is the ability to outperform competitors in the industry by being active, aggressive, and responsive in responding to improve position.

4.3.1. Autonomy

Autonomy raises independence in generating ideas and envisioning opportunities that arise and then reaching them with creativity and intelligence [33], willingness and ability in the process of idea discovery and evaluation in fashion design itself (Claudy et al., 2016). The era of technology and information that will come directs humans to develop knowledge, use, disseminate knowledge and communicate it so that an entrepreneur who has the expertise and ability to understand, analyze, and master information technology will provide broad opportunities to utilize his creativity and fully use his own intelligence. Autonomy is related to technopreneur orientation, where creating future ideas is an effort to direct future business ideas or visions in pursuit of opportunities. What needs to be considered is the development of the new strategy product, with new business plan (technology-oriented) [34]. Therefore, it is concluded that when autonomy raises independence in generating ideas in fashion design based on technology, it is most likely that autonomy will be integrated with technopreneur orientation.

4.3.2. Innovativeness

Innovative differentiation is characterized by creativity in product development, original applications of new technologies, up-to-date innovations, and quality design. pursuit of new products, processes, or business models (e.g., innovativeness) with the intended commercialization of those innovations in new product/market domains, such as; commercialize product, product based technology and quality design [35] commercialize new service & distribution; omni channel marketing, commercialize new process based technology (personalization), commercialize new marketing; market based innovation (3D digital printing, digital marketing/application, e-commerce, one on one service, web) [36][37].

Fashion design students in college can be innovators in the future clothing industry who can explore complex issues related to the environment and sustainability. It is also the hope of the clothing industry that fashion design education provides graduates as new designers following current and future needs. Not only have basic skills but who have fashion design innovation in implementing sustainability practices and strategies [33]. The concept of Industry 5.0 is a concept that will continuously develop and be open by having a creative and collaborative vision in entering the future industry to provides graduates as new designers following current and future needs [38].

4.3.3 Proactiveness

Proactiveness describes as a forward-looking perspective due to which first-mover or market-leader advantages can be achieved, searching for market opportunities to introduce new products or services ahead of one's competitors and anticipate future demand. Proactive technopreneur orientation is the perspective of seeking opportunities by looking at technology and digitalization in the future. The new products and services are ahead of the competition and acting to anticipate and ability to analyze future opportunities to develop a new product/service to shape the direction of future opportunities and gain profits [33]. Participating in a business plan competition to practice business skills is also needed to equip students with the required skills and knowledge to recognize business opportunities, search customer's insights, understand the needs of the market, create an idea, develop the business plan, run the business. Seminars on business from academicians and teaching professors can expand business efforts, networking takes a significant role in pursuing opportunities, namely by presenting alumni and collaborating and exchanging ideas with the practitioner (fashion entrepreneur, fashion designer, etc.), and collaborating with fashion industry [39], [40]. Therefore, proactive is an effort by fashion design technopreneurs in seeking business opportunities by improving business and technology skills.

4.4.4. Risk-taking

A person who undertakes risks (by creating an enterprise or business) that has the chance of profit (or success) they're looking for unconventional solutions in responding to the challenges of uncertainty through technology. Several studies reveal that technopreneurs who create new businesses show a readiness to face the risks that occur in the future from their business. Risk-taking reflects the acceptance of uncertainty and risk; by committing resources to something (outcome) that is uncertain and activities. It leads to a risk for individuals to work independently or be employed with all the uncertainty. Risk management is one of the characteristics of entrepreneurs, exceptionally creative industries [41]. Technopreneurs have to prepare themselves to become agents of change who can develop ideas and advance the fashion field in the future [42]. Nowadays, professional entrepreneurs in the Fashion and Textile industry dare to decide and create a business by taking risks [43]. Thus, creating a new fashion design business is a risk-taking ability that is motivated to be integrated by fashion design technopreneurs.

4.4.5. Technology Proficiency

Technopreneurs are entrepreneurs with technological processes and use technology to achieve entrepreneurial goals [44] with their technical capabilities can dominate the market and change the economy [45][46]. Technology and digitization significantly affect fashion design and have positive implications. Having the ability to operate technology and digitization will be easier to adapt to the demands of the clothing industry [10]. Future fashion design graduates have challenges and must be able to pursue opportunities facing the 5th industrial era. This industry is where machines/robots will collaborate well, humans will remain the driving force, and complex work by machines/robots. The highlight of Industry 5.0 focuses on delivering customer experience, hyper customization, responsive and distributive supply chain, experienced activated (interactive products), return of human resources to factories. Top technology enablers for Industry 5.0 include industrial blockchain, drones, exoskeletons, additive technology, 5G and beyond, and mixed reality [33][47]. Therefore, fashion education encourages and motivates them to be independent and have professionalism in business; this preparation is essential to support future creation and innovation in using industry requirements to design software (by collaborating with technology) will create a new intensive program for entrepreneurship in the field of fashion design [29][48][49]. Thus, technological proficiency in terms of technical skills (digitalized) and the ability of technology innovators to play a role in the fashion industry.

4. Conclusion

Based on a literature review of entrepreneurial orientation, technology-based entrepreneurship, and technopreneur orientation articles in Scopus over the past fifteen years, this study reaches two conclusions. First, it was found that the dimensions of entrepreneurial orientation are fundamental to technopreneur orientation but with technological developments. This is influenced by several definitions and dimensions of technopreneurship from the existing literature, especially that technopreneurship is technology-based entrepreneurship. The shared meanings such as creating future ideas mean the same as autonomy, business innovation is innovation in the entrepreneurial dimension, seeking opportunities means being proactive, creating new businesses means the same as risk-taking, and technological proficiency are common expressions from several literatures regarding views on technopreneurship itself that do not originate from the entrepreneurial orientation that exists in the previous literature. The model shows that the dimensions of technopreneur orientation are influenced by entrepreneurial orientation. This study also proposes a conceptual framework of technopreneur orientation in fashion design education that synthesizes knowledge from the literature. This conceptual framework is intended to develop a future sustainable fashion design curriculum that is integrated with the SDGs.

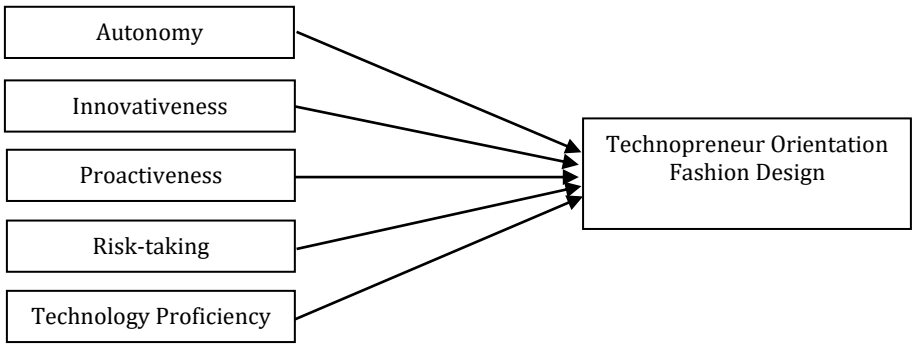

Fig 3. Proposed Conceptual Framework of Technopreneur Fashion Design

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