



The Comparison Level of Entrepreneurial Intention and Creative Thinking Skills Among Polytechnics Students in Malaysia

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DOI: <https://doi.org/10.30880/ojtp.2022.07.01.008>

Received 14 January 2022; Accepted 27 March 2022; Available online 31 March 2022

Abstract: The Malaysian government aims to make entrepreneurship one of the main contributors to new employment opportunities and reduce unemployment. This study aims to identify the entrepreneurship intention and creative thinking skills among polytechnic students in Malaysia. Respondents in this quantitative study consisted of students from Polytechnic Ungku Omar (PUO), Polytechnic METrO Kuala Lumpur (PMKL), Polytechnic METrO Johor Bahru (PMJB), Polytechnic Mersing Johor (PMJ), Polytechnic Melaka (PMK), Polytechnic Sultan Mizan Zainal Abidin (PSMZA), Polytechnic Merlimau Melaka (PMM), Polytechnic Banting (PBS) and Polytechnic Port Dickson (PPD). The respondents were selected using a purposive stratified random sampling method. The questionnaire consists of 36 items, namely: demographic, creative thinking skills, and entrepreneurship intention. Statistical tests used in this research include frequency, percentage, and t-test. The data were analyzed using Statistical Package for the Social Science (SPSS) version 21. Findings show that male students are more entrepreneurial and creative than female students. This research also found a significant difference between engineering and non-engineering polytechnic students in the level of entrepreneurial intention. This research concluded that exposure to an entrepreneurial career through informal training does not necessarily affect a student's tendency to venture into entrepreneurship. This study contributes that every student has creative potential. However, differences in gender and learning environment can lead to differences in students' creativity levels. Therefore, even though students have been following informal entrepreneurship training, they still do not choose a career as an entrepreneur.

Keywords: Entrepreneurship intention, creative thinking skills, entrepreneur, competitive human resources

1. Introduction

Entrepreneurship is a field that covers the entire action of an entrepreneur in carrying out a business venture. Entrepreneurship is a creative endeavor in building a value that previously did not exist, and then the result can be enjoyed by many people (Juliana, Hui, Clement, Solomon & Elvis, 2021). Entrepreneurship is a career option among the young generation in developed countries (Samad et al., 2019; Othman & Isaac, 2011). The field of entrepreneurship is growing in line with the Malaysian efforts in encouraging the younger generation to rely entirely on jobs available in government and private institutions. In this regard, the Malaysian government aims to make entrepreneurship a

contributor to new job opportunities and reduce the unemployment rate (Pihie et al., 2002; Amiruddin, Abd. Samad & Othman, 2015). To achieve these goals, the government has conducted various efforts to support and encourage the students to become entrepreneurs after graduation (Yunos, Sumarwati & Abdullah, 2015). The Malaysian government has provided programs on exposure to entrepreneurship courses, various policies, support tools, increase in funds, physical facilities, and counseling services to attract students to choose a career in entrepreneurship. However, the tendency of students to become entrepreneurs is still less, and they are not interested in working in entrepreneurship (Jabor & Abd Hadi, 2012).

Polytechnic transformation aimed to develop human resources to meet the needs of the new economic model based on creativity and innovation (Department of Polytechnic, 2016). Transformation polytechnics have specific characteristics of graduates to be produced by the education system in the Premier Polytechnic, Metro Polytechnic and Conventional Polytechnic includes quality, competitive and creative graduates that have a passion as entrepreneurs. METrO Polytechnic, Premier Polytechnic, and Conventional Polytechnic have differences based on the criteria, characteristics, rationale, and advantages of each Polytechnic, as shown in Table 1.

Table 1 - Differences between METrO Polytechnic, Premier Polytechnic, and Conventional Polytechnic (Department of Polytechnic Studies, 2016)

	METrO Polytechnic	Premier Polytechnic	Conventional Polytechnic
Criteria	<ul style="list-style-type: none"> ▪ Flexible delivery system, suitable for SPM graduates and those who have worked 	<ul style="list-style-type: none"> ▪ Priority to students, staff, institutions, and industry 	<ul style="list-style-type: none"> ▪ Improving standards based on transformation criteria
Characteristic	<ul style="list-style-type: none"> ▪ Thrust programs based on the needs of the urban environment, especially in the field of services. 	<ul style="list-style-type: none"> ▪ The thrust program offered is based on the strengths of a Polytechnic. ▪ Technology center. ▪ Collaborate with industry continuously and effectively. ▪ Promotion of internationalization programs. 	<ul style="list-style-type: none"> ▪ Study program diversity in engineering, technology, trade, and services. ▪ Comprehensive facilities are suitable with programs on offer.
Rationale	<ul style="list-style-type: none"> ▪ Focus on service-based study programs. 	<ul style="list-style-type: none"> ▪ The program aims to produce innovative graduates as industry leaders and high marketability. 	<ul style="list-style-type: none"> ▪ The TVET program will produce highly skilled and knowledgeable employees.
Advantages	<ul style="list-style-type: none"> ▪ Study programs that can attract interest and meet the socio-economic needs of urban communities. 	<ul style="list-style-type: none"> ▪ Have autonomy in the offering of study programs and the selection of staff and students. ▪ Each program of study has active collaboration with industry in a variety of activities. 	<ul style="list-style-type: none"> ▪ The programs offered to empower SPM graduates for employment opportunities and further education. ▪ Operational sustainability in every aspect.

The failure to see a variety of entrepreneurial opportunities has led the students in Malaysia to be less sensitive to entrepreneurship as an option of career (Othman et al., 2012). Besides, this indicates that students cannot identify opportunities and needs of creativity. A study conducted by Marfu'ah et al. (2007) found differences in creative thinking skills based on the different learning environments. The research finding by Aripin (2002) shows that environmental factors influence students to become entrepreneurs. Exposure through the informal entrepreneurship training conducted encourages students to involve in entrepreneurship. However, Asri, Zulkifeli, and Ayob (2013) found no positive influence of entrepreneurship awareness on passion in becoming an entrepreneur among Polytechnic students. Thus, this study aims to identify the entrepreneurship intention and creative thinking skills among polytechnic students in Malaysia. The objectives of this study are:

- i. To identify the comparison level of entrepreneurial intention and creative thinking skills based on gender.
- ii. To investigate the comparison level of entrepreneurial intention and creative thinking skills based on the program of study.
- iii. To investigate the differences in entrepreneurial intention level among polytechnic students based on their involvement in the informal training about entrepreneurship.

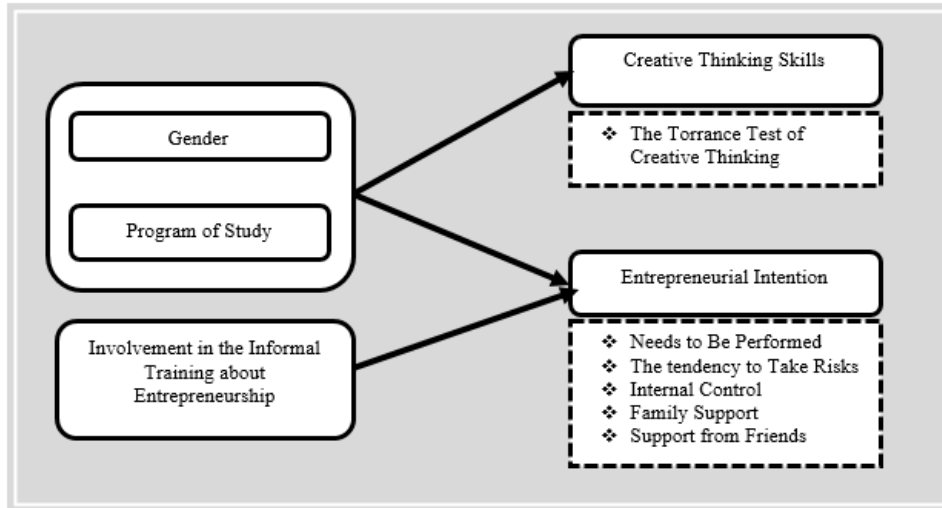


Fig. 1 - Conceptual framework

2. Methodology

The research design of this study is quantitative, and the instrument used is a questionnaire. The questionnaire consists of six (6) demographic questions, ten (10) modified items from the Torrance Creative Thinking Test (TTCT), and 20 questions to identify the level of interest in choosing an entrepreneurial field as a career. The creative thinking skills level according to total marks of originality, flexibility, fluency, and elaboration. The entrepreneurship intention level is based on the total score of needs to be performed, the tendency to take risks, internal control, family support, and support from friends. The pilot study found that the overall Cronbach's Alpha value is 0.925 or more than 0.7, so the instrument of this study is reliable.

The criteria for students studying at the polytechnic are different based on the category of polytechnic. Conventional Polytechnic students consist of SPM graduates. METrO Polytechnic students are SPM graduates and individuals who have had a career in the polytechnic environment, while Premier Polytechnic students consist of SPM graduates, staff, institutions, and industry. Conventional Polytechnics aims to produce highly skilled and knowledgeable graduates in engineering, technology, trade, and services. METrO Polytechnic focuses on service areas and is developed in urban areas to meet the needs of the urban environment. Premier Polytechnic has a technology center and collaborates with the industry to produce innovative and highly marketable graduates to become industry leaders in the future. METrO Polytechnic, Premier Polytechnic, and Conventional Polytechnic have differences based on the criteria, characteristics, rationale, and advantages of each polytechnic. If the population is heterogeneous based on certain characters and grouped in several subpopulations to be homogeneous, then the sampling method used is the stratified random sampling method (Gulo, 2002). According to Wood & Ross-Kerr (2010), in the stratified random sampling method, the population is divided into two or more groups, and then random sampling is done from each group where variables are selected as a criterion to divide the sample into several layers, should be meaningful for the study. The population in this study is consist of all the third-semester diploma students in polytechnic in Malaysia. Based on the Department of Polytechnic (2016) and the information obtained from the Polytechnic, the population of this study is 18326 students consisting of 66 people who are METrO Polytechnic students, 3574 Premier Polytechnic students, and 14686 Conventional Polytechnic students. According to the Krejcie & Morgan Table (1970), the sample for this study was 400 students.

Gulo (2002) states that the stratified random sampling method consists of:

i) Proportional stratified random sampling

A calculation to determine the number of samples by using a layered random formula according to the rate:

$$n_r = \frac{N_r}{N} \times n$$

Description:

n_r = number of samples in each strata

N_r = number of populations in each strata

N = total population of the entire strata

n = total number of study samples

Then obtained:

$$n_1 = \frac{66}{18326} \times 400 = 2$$

$$n_2 = \frac{3574}{18326} \times 400 = 78$$

$$n_3 = \frac{14686}{18326} \times 400 = 320$$

The calculation results in table 2 show that the sample for METrO Polytechnic is two (2) students, Premier Polytechnic 78 students, and Conventional Polytechnic 320 students. Therefore, the determination of the sample in this study could not use stratified random sampling according to the rate (proportional stratified random sampling) because there is a high difference between the total sample of METrO Polytechnic is only two (2) students and Conventional Polytechnic of 320 students.

Table 2 - Proportional stratified random sampling

Strata	Polytechnic Category	Total Number of Students	%	Proportional Stratified Random Sampling	
				Total Sample	%
1	METrO	66	0.4	2	0.4
2	Premier	3574	19.5	78	19.5
3	Conventional	14686	80.1	320	80.1
	Total	18326	100	400	100

ii) Non-proportional stratified random sampling

In this research, there are three strata than the calculation to determine the sample number, namely:

$$n_r = \frac{n}{3}$$

Then obtained:

$$n_1 = \frac{400}{3} = 133$$

$$n_2 = \frac{400}{3} = 133$$

$$n_3 = \frac{400}{3} = 133$$

Table 3 shows that the sample for each polytechnic has the same percentage of 33.33% or 133 students. Therefore, the sample determination in this study could not use non-proportional stratified random sampling because the total number of Diploma students in semester three from METrO Polytechnic did not reach 133 people, which is only 66 students.

Table 3 - Non-proportional stratified random sampling

Strata	Polytechnic Category	Total Number of Students	%	Proportional Stratified Random Sampling		Non-Proportional Stratified Random Sampling	
				Total Sample	%	Total Sample	%
1	METrO	66	0.4	2	0.4	133	33.33
2	Premier	3574	19.5	78	19.5	133	33.33
3	Conventional	14686	80.1	320	80.1	133	33.33
	Total	18326	100	400	100	399	100

iii) Purposive stratified random sampling

The determination of the sample total in this study was carried out by reducing the percentage of Conventional Polytechnic samples by 20% and adding 10% for each sample percentage of METrO Polytechnic and Premier Polytechnic. Then obtained:

Conventional Polytechnic: $80.1\% - 20\% = 60.1\% \rightarrow 60.1\% \times 400 = 240$

METrO Polytechnic : $0.4\% + 10\% = 10.4\% \rightarrow 10.4\% \times 400 = 42$

Premier Polytechnic : $19.5\% + 10\% = 29.5\% \rightarrow 29.5\% \times 400 = 118$

Proportional stratified random sampling according to rate and non-proportional stratified random sampling not according to rate cannot be carried out, so the calculation to determine the number of samples in this study using purposive stratified random sampling by considering the study needs. Table 4 shows that the total sample for METrO Polytechnic is 42 students, Premier Polytechnic is 118 students, while the total sample for Conventional Polytechnic is 240 students.

Table 4 - Purposive stratified random sampling

Strata	Polytechnic Category	Total Number of Students	%	Proportional Stratified Random Sampling		Purposive Stratified Random Sampling	
				Total Sample	%	Total Sample	%
1	METrO	66	0.4	2	0.4	42	10.4
2	Premier	3574	19.5	78	19.5	118	29.5
3	Conventional	14686	80.1	320	80.1	240	60.1
	Total	18326	100	400	100	400	100

Questionnaire forms sent to METrO Polytechnic were 50, and the number received by the researchers was 42 or 9.9%. For Premier Polytechnic, the questionnaires submitted were 130 pieces, and the number of questionnaires filled by the respondents was 28.5% or 121. Besides, the number sent for the Conventional Polytechnic was 363, and the researchers received only 61.6% or 262. Therefore, the questionnaire was accepted by the researcher and analyzed only 425. Therefore, the respondents only consist of 425 students from the third-semester diploma in Polytechnic Ungku Omar (PUO), Polytechnic METrO Kuala Lumpur (PMKL), Polytechnic METrO Johor Bahru (PMJB), Polytechnic Mersing Johor (PMJ), Polytechnic Melaka (PMK), Polytechnic Sultan Mizan Zainal Abidin (PSMZA), Polytechnic Merlimau Melaka (PMM), Polytechnic Banting (PBS) and Polytechnic Port Dickson (PPD). The statistical tests used in this study include a descriptive analysis of frequency and percentage and an inference analysis of the t-test. Data from the research were analyzed using Statistical Package for the Social Science (SPSS) version 21.

3. Finding and Discussion

3.1 Comparison Level of Entrepreneurial Intention Based on Gender

The demographic approach assumes that gender can influence an individual to choose entrepreneurship as a career. Physiological differences between the gender can lead to different levels of entrepreneurial intention (Ward, Hernández-Sánchez & Sánchez-García, 2019). The respondents in this study consist of 197 male students and 228 female students. The results analysis using the t-tests at Table 5 found that differences in the level of entrepreneurial intention based on gender are significant ($t=6.319$, $df=423$, $p < 0.05$).

Table 5 - Analysis level of entrepreneurial intention based on gender

Gender	N	Mean	Levene's Test for Equality of Variances		t-test for Equality of Means			
			F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Male	197	67.990	1.547	0.214	6.319	423	0.000	9.7574
Female	228	58.232						

Level of significant 0.05

This research shows there are significant differences between male and female polytechnic students in the level of entrepreneurial intention. Therefore, this study found that male students are more likely to choose a career in entrepreneurship than female students. In choosing a career, individuals have their purposes, such as building self-identity, passion, experience, financial resources, or search for wealth. Before work, a student needs to make the right decisions about planning for the future. The results were different from a study conducted by Nasharudin and Harun

(2010) that found no significant differences in the entrepreneurial intention between male and female students. The differences in the results can be the causes as the study is to test the entrepreneurial intention based on responsibility, energy, self-confidence, a view towards the future, commitment to work, creativity and innovation, internal control, and the tendency to take risks. While the entrepreneurial intention in this study was a test based on the criterion that needs to be performed, there is a tendency to take risks, internal control, family support, and support from friends.

This research found that male students are more likely to choose a career in entrepreneurship than female students. The results of this study support the study conducted by Fapohunda (2013) on 180 respondents consisting of 102 females and 78 male respondents in the Department of industrial relations and public administration of Lagos State University, Nigeria which obtained that the level of female entrepreneurial tendency is lower compared to men. Moreover, this study also supports Mazzarol et al. (1999) who researched entrepreneurs in the area of Western Australia a total of 93 respondents found that men have a greater tendency to become entrepreneurs than women. The findings of this study illustrate that polytechnic students, especially women, are less interested in pursuing a career in entrepreneurship after graduation.

3.2 Comparison Level of Creative Thinking Skills Based on Gender

Gender aspects can influence an individual’s creativity (Proudfoot, Kay & Koval, 2015). Differences in an individual’s level of creativity can be due to physiological differences between males and females. The results using the t-tests at Table 6 found that the differences in the level of creative thinking skills between male and female students are significant ($t=7.068$, $df = 423$, $p < 0.05$).

Table 6 - Analysis level of creative thinking skills based on gender

Gender	N	Mean	Levene’s Test for Equality of Variances		t-test for Equality of Means			
			F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Male	197	35.604	2.191	0.140	7.068	423	0.000	7.9023
Female	228	27.702						

Level of significant 0.05

This research found that there are significant differences between male and female polytechnic students' creative thinking levels. This study found that male students are more creative than female students. The results show there are significant differences between male and female students based on the creative thinking levels. This study supports Singh (2011) who found, there are significant differences in the level of creative thinking based on gender. However, this finding is different from the results of a study by Saeed (2004) who found that there is no difference in the level of creativity between males and females. The findings of this study also do not support the results of Kasim (2012) study which shows that there is no difference in creative thinking between male and female students. In addition, Syukri and Zulkarnain (2012) have different results, their findings show no significant differences in creative thinking level between male and female students. The results are not the same because of the differences in the background of activities of respondents. Those research respondents are Multi-Level Marketing employees, who have the activity of promoting a product service, and are always creative to ensure that sales targets can be achieved. Thus, the respondents of this study consisted of Diploma students in semester three who still need to learn various knowledge throughout the study. In this study, 197 Polytechnic male students have a moderate level of creativity, and 228 female students at a low level. The Polytechnic female students only give ideas related to what already exists in daily life and prove that female students thinking is limited. Besides, this research shows that male students are more creative than female students. In general, male students lack imagination and cannot produce original, unique, and unusual ideas.

3.3 Comparison Level of Entrepreneurial Intention Based on The Program of Study

The respondents in this study consist of 202 engineering students and 223 non-engineering students. By using the t-test, it was obtained that differences in the entrepreneurial intention based on the program of study are significant ($t=5.992$, $df = 423$, $p < 0.05$). There are significant differences between the engineering and non-engineering polytechnic students in the level of entrepreneurial intention.

Table 7 - Analysis level of entrepreneurial intention based on the program of study

Gender	N	Mean	Levene’s Test for Equality of Variances		T-test for Equality of Means		
			F	Sig.	t	df	Sig. (2-tailed)
Engineering	202	67.624	0.932	0.335	5.992	423	0.000

 Non-Engineering 223 58.345

Level of significant 0.05

This finding is supported by the results of Law and Breznik (2017), which found that engineering students have higher attitudes and intentions towards the field of entrepreneurship compared to non-engineering students. The findings of this study are also in line with Gupta et al. (2005) who argued that engineering and non-engineering students' perceptions of entrepreneurship are different. The finding shows that engineering students would prefer a career in entrepreneurship compared with non-engineering students. Entrepreneurial intention levels among engineering students are moderate, while non-engineering students have a low level. This situation is similar to the results of the study by Indarti and Rostiani (2008) that found no significant differences in the entrepreneurial intention among Norwegian students that take or do not take economics and business studies programs. These results also obtained that exposure to entrepreneurial careers, according to non-formal training does not necessarily affect a student's tendency to become an entrepreneur. So, the results of this study can be a reference to the Polytechnic to further encourage non-engineering students to choose the field of entrepreneurship as a career in the future because they already have specific knowledge in their field of study. Apart from that, based on this discussion, it is hoped that more new entrepreneurs with an engineering background will further boost the development of the technology industry in Malaysia.

3.4 Comparison Level of Creative Thinking Skills Based on The Program of Study

This study shows that the differences in the level of creative thinking skills between engineering and non-engineering polytechnic students are significant ($t=6.879$, $df = 423$, $p < 0.05$). There are significant differences between engineering and non-engineering polytechnic students based on the level of creative thinking skills. This study shows that engineering students have a moderate level of creative thinking skills and non-engineering students have a low level of creative thinking skills. Besides, based on this study it was obtained that engineering students have a moderate level of creative thinking skills and non-engineering students have a low level of creative thinking skills. These results are parallel with the findings by Ayob et al. (2011) that show the level of creative thinking skills among engineering students from the National University of Malaysia are at the level of creative thinking skills on the average score of creativity.

Table 8 - Analysis level of creative thinking skills based on the program of study

Gender	N	Mean	Levene's Test for Equality of Variances		T-test for Equality of Means		
			F	Sig.	t	df	Sig. (2-tailed)
Engineering	202	35.406	1.460	0.228	6.879	423	0.000
Non-Engineering	223	27.704					

Level of significant 0.05

3.5 Differences Level of Entrepreneurial Intention Among Polytechnic Students Based on Their Involvement in The Informal Training About Entrepreneurship

The majority of students in the third-semester diploma in Polytechnic involved in the informal training entrepreneurship includes 276 respondents, but 149 respondents have never attended the informal training about entrepreneurship. Data analysis shows that there were no significant differences in the level of entrepreneurial intention among students of polytechnics based on the involvement of informal training about entrepreneurship ($t=1.618$, $df = 423$, $p > 0.05$).

Table 9 - Analysis differences level of entrepreneurial intention based on their involvement in the informal training about entrepreneurship

Informal training about Entrepreneurship	N	Mean	Levene's Test for Equality of Variances		t-test for Equality of Means			
			F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Attended	276	63.750	2.368	0.067	1.618	423	0.106	2.6927
Not Attended	149	61.057						

Level of significant 0.05

This finding means that the polytechnic students, who have attended or not attended the informal training about entrepreneurship, have the same level of entrepreneurial intention at a moderate level. This study shows that exposure to the entrepreneurial career by informal training does not necessarily affect the tendency of a student to become an entrepreneur. However, these findings are not consistent with Idris (2009), who obtained that students enrolled in entrepreneurship courses during the study will tend to become entrepreneurs after graduation. Different results may be because the research consists of final year students, while the respondents of this study are third-semester students. However, the duration of the student's study at the educational institution affects the amount of knowledge that the student has acquired. Thus, based on this study, it is concluded that exposure to an entrepreneurial career through informal training does not necessarily affect a student's tendency to venture into entrepreneurship. Therefore, even though students have been following informal entrepreneurship training, they still do not choose a career as an entrepreneur.

4. Conclusion

Creativity is closely related to entrepreneurship because to be successful in running a business, an entrepreneur needs to be creative. Besides, a series of creative processes are used by entrepreneurs to identify new business opportunities, generate new ideas to improve product quality, resolve existing issues, and also address existing challenges/risks. Polytechnic students that have a high level of creative thinking skills are an asset to the polytechnics to prove to the public that the polytechnics can produce quality and competitive human resources. The level of entrepreneurial intention, higher polytechnic students will increase the number of entrepreneurs in Malaysia. Therefore, this study will hopefully help the lecturers, Department of Polytechnic Education, Ministry of Education, Malaysia, and others who are relevant to design an effort to increase the level of creative thinking skills and the level of entrepreneurial intention among polytechnic students.

This study contributes to the understanding of students that each student has creative potential, but differences in gender and learning environment can lead to the existence of differences in the level of creativity possessed by each student. This study also shows that Polytechnic students have trouble using imagination to generate unique ideas because they only focus on something that is in everyday life. Thus, only a small percentage of students can use high imagination to build new ideas and are rarely thought of by other students. This research indicates a lack of creative potential among Polytechnic students in general. In this regard, male students can come up with new ideas and good descriptions while still being brief, while the majority of female students are unable to describe the situation well because their thinking is still rooted in their experiences in daily life.

This study can also be one of the sources of reference that a student's expertise in a particular field of study can be an opportunity to start an entrepreneurial career in line with the level of creative thinking skills. Students should use creativity to act quickly in sniffing and seizing various new business opportunities and not just focus on existing types of entrepreneurship. Besides, entrepreneurial exposure during the study should be applied by students to reduce the risk of failure in starting a venture or venture into entrepreneurship.

The researcher proposed to conduct a comparative study of verbal and figural creativity based on the criteria of description, originality, fluency, and fluency. Future research recommends identifying creative learning in formal education. In addition, future studies can explore the influence of psychological characteristics such as achievement needs and internal control against entrepreneurship intention. Further studies recommend examining family and peer background factors that influence entrepreneurship intention. In addition, future researchers recommend identifying factors that influence the effectiveness of informal entrepreneurship training on entrepreneurial intention.

Acknowledgement

The author would like to express appreciation to the Ministry of Higher Education for supporting this research through Fundamental Research Grant Scheme (FRGS/1/2018/SS04/UTHM/02/1) VOT K044.

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