

Assessing Gender Differences in Creative Self-Efficacy, Creative Ability and Creative Environment Dimensions among Lower Secondary School Students in Selangor, Malaysia

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Abstract: This study aims to assess gender differences in creative self-efficacy, creative ability and creative environment dimensions among lower secondary school students in Selangor. A survey was conducted to empirically investigate the creativity differences between male and female students. A total of 374 lower secondary school students, consisting of 188 male and 186 female students, that were randomly selected from Form 1 and Form 2 classes from a secondary school in Selangor, Malaysia participated in this study. The creativity of students was assessed by a creativity level questionnaire instrument focused on three creativity dimensions; creative self-efficacy, creative ability, and creative environment. Data analysis showed that the overall creativity level between male and female students was almost the same ($m=3.38$, $m= 3.42$). Furthermore, the t-test analysis indicated no significant differences between genders in creative self-efficacy and creative ability dimensions, respectively. However, there was a significant difference identified in the creative environment dimension. Findings proved that gender differences did not affect the self-efficacy and ability of students in creativity except in a creative environment, which has a different impact on gender. Hence, educational institutions should pay attention to providing a conducive environment that might affect the creativity of the students.

Keywords: Gender difference, Self-report, Creative self-efficacy, Creative ability, Creative environment, Lower secondary school students

1. Introduction

Innovation and problem-solving skills are crucial for young students to remain competitive in the future workforce. Hence, applying skills such as creativity, collaboration, and problem-solving are very important for success at work in the 21st century. Creativity is a vital skill to progress in the global knowledge society and workforce. Nowadays, most works are being carried out in ad-hoc project-oriented teams in which team members must take on specific and significant responsibilities (Mahdi et al., 2015). Everyone in the team needs to regularly adapt to new situations or systems for problem-solving strategies. Hence, only creative persons would be able to cater to such situations spontaneously. Their creative talents will allow them more opportunities to tailor services and products to suit the needs of the users (Collard & Looney, 2014).

Creativity is always the main reason for producing unique and useful outcomes or ideas in a certain domain. It begins with a creative person using a creative process to produce a creative product or ideas in a creative place (Golann, 1963; Rhodes, 1961). Therefore, most countries have realized that fostering creativity in educational settings is very important. Therefore, more education administrations are initiating curriculum reformation to emphasize creativity development among the younger generation (Cheng, 2010; Lin, 2010; Shaheen, 2010).

Currently, workers have to be creative to address the many challenges that arise in the workplace. Thus, students are required to be equipped with creative and critical thinking skills for the future workforce. Moreover, the emphasis on creative skills is clearly outlined in the Malaysian education system. Malaysia Education Blueprint (2013) has highlighted that students should be able to express themselves creatively (Ministry of Education Malaysia (MoE), 2018). This blueprint highlighted that only creative people are able to fit themselves in any situation and condition (Amran et al., 2021).

Unfortunately, the gender gap in creativity is common in most industries. The gender stereotype problem was greater when men and women evaluated their own creativity as compared to when their creativity was rated by others. It is because women were more self-critical regarding creativity (Hora, Badura et al., 2021). Previous studies also showed similar findings as in the Malaysian context among schoolchildren. It was indicated that boys obtained higher means of creative perceptions, including artistry, initiative and imagination than girls (Palaniappan, 2001, 2007). Based on the above assumption that there is a significant difference of creativity between genders, hence this study aims to investigate gender differences in the three dimensions of creativity, which are creative self-efficacy, creative ability, and creative environment among lower secondary school students.

Gender differences in creativity

Gender stereotypes in creativity have occurred in society because of the inaccurate perceptions of creative traits definition. Commonly, people tend to associate creativity with masculine characteristics such as risk-taking, daring, and boldness instead of feminine characteristics such as cooperativeness, supportiveness, and reflectiveness. If the culture of gender stereotypes is accepted in society, there will be implications for organisational success. If the organisations tend to see men's ideas and output as creative over women's ideas, they would sooner miss out on a real and impactful innovation (Adams, 2015; Proudfoot et al., 2015).

However, Kim (2009) highlighted that men and women are born with equally creative potential. Both creative underachievers and successful innovators are influenced by their environments, whereby there are no apparent gender differences in actual creative abilities (Baer & Kaufman, 2008; Williams, 2019).

On the contrary, when it comes to self-reported creativity, especially for creative self-efficacy, gender differences were found to be higher than when others reported it. Likely, some combination of women undervaluing or men overestimating their creative contributions produces a larger gender gap for self-rated creativity (Hora, Badura et al., 2021). While in a creative environment, women are more likely than men to indicate their concern for resources and to receive support from the organizations to adequately engage in creative activities (Hora, Lemoine et al., 2021).

Creative self-efficacy

Many factors lead to one's creativity, among them is creative self-efficacy. Self-efficacy refers to the perception and belief that a person has skills and that they utilize them effectively to succeed in a particular action to achieve a goal. In other words, it is a belief the person has in his ability to produce creative outcomes in general or a specific setting (Brockhus et al., 2014).

Furthermore, creative self-efficacy is related to task effort, performance, persistence, resilience in the face of failure, effective problem solving and self-control. Certainly, a person with high self-efficacy can produce better task performance because it improves motivation. Likewise, a person with high self-efficacy usually has high creative ability. Therefore, it is conceivable that creative ability is largely determined by creative self-efficacy (Yu, 2013).

Creative ability

Creative ability is the skill that reflects a person's creativity in various spheres of vital activity, such as finding solutions in non-standard situations or looking at an object in a non-traditional way. People with creative ability prefer to engage in unique thinking because of an intrinsic desire to find new and better things and support others in creative self-realisation (Abilmazhinova et al., 2021).

Additionally, the creative ability can be improved by engaging students with learning strategies such as project and problem-based learning (Rudibyani, 2019). On the other hand, the creative ability also can be stimulated through surrounding elements and social environments such as blue lighting, happy music and peer support (Abdullah et al., 2016; Ritter & Ferguson, 2017). Therefore, a creative environment can influence students' creativity because a supportive environment could elicit positive moods and significantly enhance students' learning goal orientation and knowledge sharing (Fan & Cai, 2022).

Creative environment

A creative environment is the best place or circumstance in which creativity can flourish. In particular, it refers to the connection between human beings and their surroundings. It includes the physical elements and social circumstances in which creativity is more likely to develop. Moreover, a creative environment is able to encourage innovative ideas and practices. The environment itself is a significant factor in stimulating and enhancing creativity where it is the result of interactions between the individual and the environment (Mayfield & Mayfield, 2010).

Thus, creativity improvement is influenced by the interactions of people at home, school and in society. Since students are unable to learn solely from imagination, it is why creative classes should be conducted in an open environment (Bin Rahmat & Maaruf, 2017). Therefore, the development of creativity among students requires an encouraging school environment. Certainly, it requires providing elements of an effective educational environment such as creative teaching, activities, teamwork and assessment methods that work in a single framework aimed at stimulating students' creativity (Garcês et al., 2016).

Given these points, the following hypotheses are developed:

H₁: There is a significant difference between male respondents and female respondents in overall creativity.

H₂: There is a significant difference between male respondents and female respondents in creative self-efficacy.

H₃: There is a significant difference between male respondents and female respondents in creative ability.

H₄: There is a significant difference between male respondents and female respondents in a creative environment.

2. Methodology

Research Design

This study employed a quantitative cross-sectional approach to explore self-report creativity among lower secondary school students in the school setting. Quantitative analysis is employed in the cross-sectional study, which is deemed the most suitable way to administer to a large number of participants. The advantage of using a cross-sectional study is that it occurs at one point in time and focuses on many different areas of human behaviour (Polit et al., 2001). This provides an idea of the prevalence of gender differences in students' creativity in the surveyed location.

Sampling and Procedure

This study was conducted in one secondary school in Klang, Selangor. This school was selected because it has the largest student population in Malaysia. The total population of the target group was 1560 students. This target population only referred to Form 1 and Form 2 students in the school. This target group consists of students ranging from 13 to 14 years old. The sample size for this study was determined by Raosoft®, an online sample size calculator. Based on the confidence level of 95% and the margin of error of 5%, a total of 309 will meet the minimum recommended sample size. However, in order to ensure a good response rate, 400 students were chosen to participate in the study.

Each respondent was given a self-report questionnaire with an accompanying cover letter that explained the study. Before the start of the survey, permission was acquired from the Ministry of Education Malaysia, the State Education Department of Selangor, and the school administration. A simple random sampling was employed where each student in the population had an equal chance to be selected for the survey (Singh, 2003).

The survey was performed in March 2019 for five days. There were 21 classes of Form 2 and 20 classes of Form 1 in the school. On the first day, Form 2 students from four classes participated in the survey. The participants of the study were selected based on their seats in odd numbers starting from the right side of the class. On the second day of data collection, another four classes of Form 2 students participated in the survey. For the second day, the students who sat in even numbers starting from the left side of the class were selected to participate in the study. The procedure on the first day was repeated with four other classes of Form 2 students on the third day. On the fourth day, four Form 1 classes were selected to participate in the survey. Students who sat in even numbers starting from the left side of the class were selected to participate in the survey. On the fifth day of data collection, another four Form 1 classes were selected to participate in the study. The participants were selected based on their seats in odd numbers starting from the right side of the class. All students were given 30 minutes to complete the questionnaire. The total number of respondents who completed the questionnaire was 374 students. Table 1 shows the genders and ages of the respondents in the study.

Table 1. Genders and Age of the Respondents

Gender	Age	Total
Male	13 years old	79
	14 years old	109
Female	13 years old	69
	14 years old	117
Total		374

Instrumentation

A self-report creativity level questionnaire was used in this study to assess the level of students' creativity in three dimensions, namely creative self-efficacy, creative ability, and creative environment. The questionnaire was adopted from creative ability tests (Hsu et al., 2014; Perry, 2014), self-efficacy questionnaires (Brockhus et al., 2014; Yu, 2013), and creative environment questionnaire (Mayfield & Mayfield, 2010) and also translated to the Malay language. The researcher used a back-to-back translation to ensure the accuracy of the content and the use of language with the help of a language expert who is a senior language teacher. The verification of the questionnaire was done by four content experts among university lecturers. Changes to the content of the questionnaire were not required. The completed questionnaire contained 38 items on a five-point Likert scale. The five-point Likert scale used is shown in Figure 1.

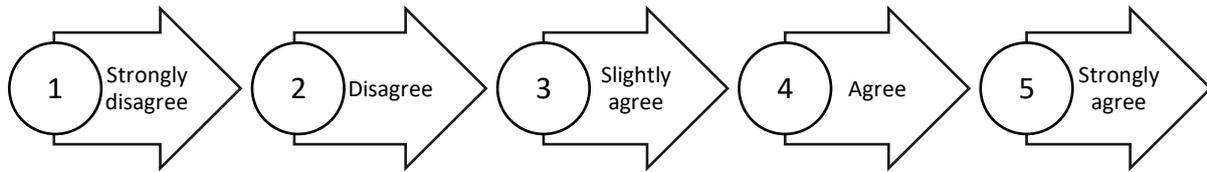


Fig. 1 Five-point Likert Scale.

Data Analysis

Data were analysed using Statistical Package for the Social Science (SPSS) V20. Descriptive statistical analysis was used to identify the mean value of overall creativity level and each of creative self-efficacy, creative ability and creative environment dimensions. Besides, an independent samples t-test was used to compare the mean score of the overall creativity and its three dimensions between male and female students from a secondary school.

The levels of creativity of the students were measured with the five degrees of intensity as presented in Table 2. The values with the mean score of 4.30 to 5.00 are rated as the highest level of creativity, while the values of 1.00 to 1.89 are rated as the lowest level of creativity. This weighted mean interval for the statistical value scale was adapted from the Malaysian Education Policy Planning and Research Division (BBPDP), Ministry of Education Malaysia to interpret the students' creativity levels. Table 2 shows the interpretation levels based on weighted means to determine students' creativity levels.

Table 2. Mean score interpretation.

Mean score	Interpretation
1.00 – 1.89	Very low
1.90 – 2.69	Low
2.70 – 3.49	Moderate
3.50 – 4.29	High
4.30 – 5.00	Very high

Source: Bahagian Perancangan, Penyelidikan dan Dasar Pendidikan (2006)

Pilot study

Pilot study was conducted to identify the reliability of the instrument. A total of 35 students were selected for the pilot test. These students who participated in the pilot study were not involved in the real study. Cronbach Alpha reliability analysis was used to analyse the reliability of the self-report inventory. According to Gliem and Gliem (2003) and Terwee et al. (2007), an instrument can be deemed reliable if the value of Cronbach's alpha is above .70. Since the Cronbach Alpha values for the three dimensions were above .80, hence the reliability of this instrument has been ascertained as shown in Table 3

Table 3. Cronbach alpha value, α of the instrument.

Creative	Cronbach alpha value, α
Self-efficacy	0.905
Ability	0.952
Environment	0.888

3. Findings

Overall creativity level

After the data was collected, descriptive statistical analysis and independent sample t-test analysis were conducted to identify the students' overall creativity level and significant differences in the overall creativity between male and female students.

Table 4. Overall creativity among gender

Gender	Male			Female		
	Mean	SD	Level	Mean	SD	Level
Overall Creativity	3.38	0.46	Moderate	3.44	0.43	Moderate

Table 4 shows that female students' self-reported creativity levels were slightly higher than male respondents, even though both genders had a moderate overall creativity level. In order to determine any significant difference existed between genders, thus, an independent sample t-test was carried out to examine any statistical difference between male and female groups.

Table 5. T-test analysis on overall creativity to determine statistical differences.

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig	t	df	Sig. (2-tailed)	Mean diff.	SD	95% Confidence Interval of the Difference	
								Lower	Upper
Overall creativity	0.122	0.727	-0.809	373	0.419	-0.0368	0.0455	-0.1262	0.0526

Table 4 shows that the mean score of creativity level of female respondents was slightly higher ($M = 3.44$, $SE = 0.425$) than male respondents ($M = 3.38$, $SE = 0.456$). However, the difference was insignificant with $t(373) = -0.809$, $p > .05$ as indicated in the independent samples t-test analysis in Table 5. Based on this result, H_1 was rejected.

Next, the creativity level between genders of the students was assessed separately in three dimensions, which are self-efficacy, creative ability, and creative environment to assess students' perceptions based on the data collected from the self-report creativity level instrument.

Creative self-efficacy

The mean comparison of creative self-efficacy was analysed to determine the mean value between genders. Table 6 shows the mean value and creative self-efficacy level.

Table 6. Mean value among genders in creative self-efficacy.

Gender	Male			Female		
	Mean	SD	Level	Mean	SD	Level
Creative self-efficacy	3.41	0.55	Moderate	3.35	0.53	Moderate

Table 6 shows that the creative self-efficacy of male respondents was slightly higher than female respondents. It means that they have a higher belief that they are creative persons compared to female respondents. A detailed mean value for each item of creative self-efficacy is displayed in Table 7.

Table 7. Mean value among genders of each item in creative self-efficacy.

Item	Male			Female		
	Mean	SD	Level	Mean	SD	Level
1 I consider myself a creative person.	3.36	0.98	Moderate	3.27	0.96	Moderate
2 I am a good source of creative ideas.	3.26	1.07	Moderate	3.12	1.11	Moderate
3 I am not afraid to take risks for my ideas.	3.34	1.12	Moderate	3.19	1.15	Moderate
4 I believe that creativity comes from hard work and persistence.	3.98	1.01	High	4.27	0.75	High
5 My creativity comes from careful planning and forethought.	3.28	1.10	Moderate	3.23	1.00	Moderate
6 Teachers and classmates consider that I can produce unique outcomes.	3.24	0.97	Moderate	3.08	0.86	Moderate
7 Teachers and classmates consider that my outcomes can stimulate diverse ideas.	3.23	0.92	Moderate	3.06	0.88	Moderate
8 My idea is different from others' ideas.	3.61	1.04	High	3.55	1.06	High

Table 7 displays the mean value of each item in creative self-efficacy between genders. It revealed that male respondents have a higher belief that they are creative persons in all items of self-efficacy except item four. Female respondents have a higher belief that creativity can be achieved through hard work and persistence. Female respondents seem to focus on creativity in terms of the process itself compared to the end outcome. In comparison, male respondents have more confidence in their production of ideas and the outcomes of their creativity. Further analysis was done to examine the difference between both genders in creative self-efficacy in Table 8.

Table 8. T-test analysis of creative self-efficacy to determine statistical differences.

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean diff.	SD	95% Confidence Interval of the Difference	
								Lower	Upper
Creative self-efficacy	0.041	0.839	1.229	373	0.220	0.0686	0.0558	-0.0412	0.1783

Based on Tables 6 and 8, on average, male respondents have higher level of creative self-efficacy ($M = 3.41$, $SE = 0.548$) than female respondents ($M = 3.35$, $SE = 0.533$). However, the difference was insignificant with $t(373) = 1.229$, $p > .05$. Therefore, H_2 was rejected.

Creative ability

The mean comparison of creative ability was analysed to determine the mean value among genders. Table 9 shows the mean value of both genders.

Table 9. Mean value among genders in creative ability.

Gender	Male			Female		
	Mean	SD	Level	Mean	SD	Level
Creative ability	3.36	0.506	Moderate	3.34	0.472	Moderate

Table 9 shows that male respondents also rated higher creative ability compared to female respondents, although there was not much difference between the two mean values. A detailed mean value for each item of creative ability is shown in Table 10.

Table 10. Mean value among genders of each item in creative ability.

Gender	Item	Male			Female		
		Mean	SD	Level	Mean	SD	Level
1	I come up with new solutions to my daily problems.	3.31	1.06	Moderate	3.40	0.99	Moderate
2	I always consider alternative solutions to a problem on hand.	3.22	1.08	Moderate	3.38	0.99	Moderate
3	I will search for new technologies when I am learning.	3.55	1.14	High	3.36	1.03	Moderate
4	I will search out new techniques when I am learning.	3.70	1.04	High	3.66	0.94	High
5	I will search out new product ideas when I am learning	3.71	0.94	High	3.80	0.86	High
6	I can accept criticism of my works from other people.	3.21	1.16	Moderate	3.49	1.11	Moderate
7	I often have a new approach to problems.	3.17	0.94	Moderate	3.18	0.88	Moderate
8	I use my creativity when faced with challenges.	3.51	1.10	High	3.49	0.99	Moderate
9	I can come out with various outcomes for a school project in a short period.	2.79	1.07	Moderate	2.58	1.00	Moderate
10	When I get a new idea, I get totally focused until I have pursued it completely	3.99	0.88	High	3.97	0.84	High
11	It is easy to think for ideas when looking for an answer to a problem.	3.32	1.06	Moderate	3.03	1.03	Moderate
12	I assess different opinions and select the most plausible one.	3.61	1.02	High	3.94	0.86	High
13	I do a lot of experimentation (trial and error) to come up with a new workable idea	3.46	1.14	Moderate	3.41	1.11	Moderate

Gender		Male			Female		
Item	Mean	SD	Level	Mean	SD	Level	
14	I look for connections in diverse areas for a perfect solution.	3.27	0.95	Moderate	3.38	0.95	Moderate
15	When I examine existing products, I usually critically evaluate them to see how I can improve them	3.31	1.15	Moderate	3.21	1.09	Moderate
16	I often look for new ideas outside of my own field and try to apply them to my own	3.26	1.14	Moderate	3.34	1.05	Moderate
17	I often use the technique of brainstorming to come up with new ideas.	3.06	1.09	Moderate	2.96	0.96	Moderate
18	I can practically adopt alternatives based on specific needs.	3.10	1.04	Moderate	2.84	1.05	Moderate
19	I typically create new ideas by systematically modifying an existing idea.	3.32	1.01	Moderate	3.04	1.04	Moderate

Table 10 displays the mean value of each item in creative ability between genders. The results showed that both male and female respondents could be superior in some creative abilities. However, male respondents have a greater creative ability where they rated higher in eleven items compared to female respondents who rated higher in only eight items. T-test analysis was executed to identify the difference in the creative ability of both genders. The result is shown in Table 11.

Table 11. T-test analysis of creative ability to determine statistical differences.

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean diff.	SD	95% Confidence Interval of the Difference Lower Upper	
Creative ability	0.885	0.347	0.448	373	0.655	0.0226	0.0506	-0.0768	0.1220

Tables 9 and 11 display that male respondents have a higher level of creative ability ($M = 3.36$, $SE = 0.506$) than female respondents ($M = 3.34$, $SE = 0.472$). There was also no significant difference between both genders, with $t(373) = 0.448$, $p > .05$. Therefore, H_3 was also rejected.

Creative environment

The mean comparison of the creative environment was analysed to determine the mean value between genders. Table 12 shows the mean value and creative environment level.

Table 12. Mean value among genders in a creative environment.

Gender	Male			Female		
	Mean	SD	Level	Mean	SD	Level
Creative environment	3.37	0.5175	Moderate	3.57	0.5240	High

Table 12 shows that female respondents rated higher for the creative environment compared to male participants. Female respondents tend to rate their surroundings more positively, such as getting considerable support from teachers and friends, and they also have something special when it comes to creative works. A detailed mean value for each item of the creative environment is shown in Table 13.

Table 13. Mean value among genders of each item in a creative environment.

Gender	Item	Male			Female		
		Mean	SD	Level	Mean	SD	Level
1	I always have a pen and notepad in handy to note down new ideas as they occur.	2.74	1.21	Moderate	2.89	1.27	Moderate
2	My teacher encourages me to be creative.	3.58	1.05	High	3.72	1.05	High
3	My teammate is supportive of doing things in new ways.	3.43	1.06	Moderate	3.75	1.02	High
4	I have the resources I need to do my work.	3.23	1.04	Moderate	3.40	1.13	Moderate
5	I have control over how I do my work.	3.33	1.07	Moderate	3.61	1.05	High
6	It is easy to be creative when I can determine the work datelines	3.20	1.16	Moderate	3.40	1.14	Moderate
7	I have the freedom to decide what tasks I am going to do.	3.27	1.18	Moderate	3.40	1.08	Moderate
8	I have my own particular place for creative work and thinking.	3.11	1.23	Moderate	3.10	1.25	Moderate
9	I tend to do my creative work in a quiet surrounding when I am engaged in creative works.	3.88	1.22	High	4.11	1.14	High
10	I tend to do my creative works in a certain background music when I am engaged in creative work.	3.77	1.26	High	3.90	1.22	High
11	I have favourite tools (pen/pencil/etc.), without which I would find it hard to concentrate when I am engaged in creative work.	3.50	1.16	Moderate	3.94	1.11	High

Table 13 displays the mean value of each item in a creative environment between genders. Female respondents rated all items in a creative environment higher than male respondents except for item 8, in which male respondents rated their particular place for creative work and thinking higher than female respondents. However, the value is only different by 0.01. It can be indicated that female respondents possess greater stereotypical 'feminine traits' such as cooperativeness and supportiveness (Proudfoot et al., 2015). They are also emotionally attached to something like favourite tools for creative activities. Further analysis was conducted to identify differences between genders in creative environments as shown in Table 14.

Table 14. T-test analysis of the creative environment to determine statistical differences.

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2- tailed)	Mean diff.	SD	95% Confidence Interval of the Difference	
								Lower	Upper
Creative environment	0.543	0.462	-3.747	373	0.000	-0.202	0.0538	-0.307	-0.096

Based on Tables 12 and 14, on average, female respondents rated a higher level of creative environment ($M = 3.57$, $SE = 0.524$) than male respondents ($M = 3.37$, $SE = 0.5$). Also, the difference was significant $t(373) = -3.747$, $p < .05$. Hence, H_4 was accepted.

4. Discussion

This study focused on assessing the gender differences in students' creativity in the dimensions of creative self-efficacy, creative ability, and creative environment. The findings showed that male and female respondents had no differences in their creativity perception except for their views on the creative environment. It showed that female respondents' engagement had much more influence on the surrounding, organisation and the learning setting, for example, guidance, supporting material and freedom of choice. It is similar to the study by Spieler and Slany (2018), which indicated that female students significantly preferred the aspects of the working process but did not mention the activity aspect explicitly. In contrast, male students more frequently mentioned missing features in the activity itself and stated that they liked the activity. With a focus on female students, the results concluded that a suitable classroom setting is significantly more important for them than the learning activity.

For overall creativity, female respondents were slightly higher in mean value compared to male respondents, but there was no significant difference in both genders. On the contrary, results from creative self-efficacy and creative ability dimensions indicated that male respondents rated their creativity slightly higher than female respondents. It can be seen that male respondents tend to rate higher in self-reported assessments compared to other-reported assessments. As mentioned by Hora, Badura et al. (2021), women possess lower creative self-efficacy and diminished 'self-expectations for creativity.' They also stated then when creativity was self-rated, the gender gap was stronger than when it was rated by others. Even so, there are no significant differences between genders for creative self-efficacy and ability factors. The results agreed with studies by Chan (2001), Goldsmith and Matherly (1988) and Naderi et al. (2009), which confirmed that there were no significant differences in creativity for both men and women.

Nevertheless, a different result was achieved from the creative environment dimension. Female respondents rated higher in creative environments, including their surroundings, support from teachers and friends and freedom of choice. The result was also supported by a study from Proudfoot et al. (2015), which indicated that females tend to show cooperativeness and supportiveness as part of their creative process during creative work execution. It showed that they have more appreciation of their surroundings and the support obtained. Thus, the environmental factor significantly influences their creativity compared to male respondents. There was also a significant difference in the creative environment factor between both genders in the creative environment aspect. The result proved that a creative environment significantly influences students' creativity and encourages students to be creative (Tehrani, 2015; Yourdshahi et al., 2018).

5. Conclusion

People are naturally born creative. It is the culture and environment that can have a significant impact on their way of thinking (Kim, 2009). Based on the study, there are statistically significant different aspects of creativity that are more important for female students than male students. It showed

that the creative environment and support are particularly important for engaging female students in creativity. Thus, for them, the tool is essential, as well as the learning environment as a whole, and the ability to express their own choice. Therefore, it is important to prepare suitable creative environments, particularly focusing on aspects of gender sensibility and awareness (Spieler & Slany, 2018).

Nowadays, creativity characteristics are emphasised more on collaborative, communication and problem-solving skills instead of boldness, risk-taking and bold decisions to endure the global challenges in the future. Therefore, creativity should not be narrowed only to the end product, which is a novel outcome. More importantly, creative process characteristics such as communication, collaboration and adaptability need to be nurtured in students to sustain and to be on par alongside the speed of growth in innovation and economic development of the world (Hawari & Noor, 2020).

To enhance students' creativity regardless of gender, it is important to avoid prejudices and stereotypes about female students being less creative than male students. Female students should also be given the same opportunity to engage with creative activities of their choice and freely express their ideas. Moreover, all students should be assessed equally for their creative performance. Despite possessing similar creative abilities, men nonetheless tend to attain higher levels of creative performance than women (Hora, Badura et al., 2021). Therefore, creativity should be assessed by others to determine a person's creativity, not by self-report instruments. This would reduce female students' perception of risk and generate the impression that they will have creative credibility, which drives creative ability (Hora Lemoine et al., 2021).

6. Co-Author Contribution

The authors affirmed that there is no conflict of interest in this article. Author 1 carried out the fieldwork, prepared the literature review and overlooked the writeup of the whole article. Author2 edited the language used in the article. Author3 edited the statistical analysis and interpretation of the results.

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8. References

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