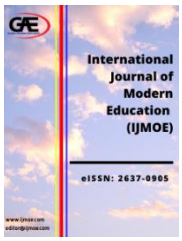
International Journal of Modern Education
EISSN: 2637-0905
IJMOE
Volume 5 Issue 19 (December 2023) PP. 280-290
DOI: 10.35631/IJMOE.519020



INTERNATIONAL JOURNAL OF MODERN EDUCATION (IJMOE)
www.ijmoe.com

GLOBAL ACADEMIC EXCELLENCE

CREATIVE AND CRITICAL THINKING OF BECOMING A TEACHER

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Article Info:

Article history:
Received date: 25.10.2023
Revised date: 16.11.2023
Accepted date: 21.12.2023
Published date: 27.12.2023

To cite this document:
Azmi, A. N., Chua Y. P., Loo, F. Y, & Md Zahir, N. (2023). Creative and Critical Thinking of Becoming a Teacher. *International Journal of Modern Education, 5* (19), 280-290.

DOI: 10.35631/IJMOE.519020

Abstract:

The education world stresses developing teachers with creative and critical thinking since student learning at every level requires good and effective teaching provided by teachers. This is important since the phenomenon of teachers losing their creativity in delivering their teaching has become increasingly prevalent. Based on this issue, this paper presents an insight into the creative and critical thinking styles of pre-service teachers in the institute of teacher education before they start their teaching profession. Using proportional stratified random sampling, 331 samples from three different institutes of teacher education have been chosen to gather information in this study. A quantitative approach using the YCreative-Critical Styles test is deployed to indicate the thinking styles among respondents. All data was analysed descriptively to review the creative and critical thinking styles among pre-service teachers based on gender, age group classification, and their educational level. The dispersion of thinking styles according to gender, age, and education levels reveals that the weightage is inclined from creative to balanced and ends at critical thinking. The results indicated that the majority of pre-service teachers (n = 161) possess critical thinking styles compared to balanced and critical thinking styles. Interestingly, critical thinking styles are higher (f = 91) when pre-service teachers are newly enrolled in the programme, and this number declines (f = 70) when compared to those already in programme. Based on these results, it is suggested that the capability of creative and critical thinking should be developed among pre-service teachers since they are in training. It is hoped that helping pre-service teachers become

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EISSN: 2637-0905
IJMOE
Volume 5 Issue 19 (December 2023) PP. 280-290
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future teachers with the ability to be creative and critical thinkers will contribute to better learning experiences for their students in the future.

Keywords:

Creative Thinking, Critical Thinking, Pre-service Teachers, Thinking Styles

Introduction

Creativity is an essential trait that is needed in a teacher. A passionate teacher is one who is creative, and this creativity needs to be nurtured since they are in their teacher training programs. A creative teacher is defined as a teacher who is able to teach in a more meaningful and invigorating manner, which helps students develop their cognitive skills (Hu et al., 2016; Rankin & Brown, 2016; Tsai et al., 2018). Since creative teaching is important in equipping students to be more competitive, this trait is now considered essential in the education environment (Chen & Yuan, 2021; Davis et al., 2013; Richards & Bredfeldt, 2020). Furthermore, findings from a study conducted in a higher education setting in Malaysia found that the creativity level among undergraduate students is still low and needs to be nurtured while they are in the education environment (Long et al., 2020). To be more precise, pre-service teachers lack a clear definition of creativity, and their perception of creativity seems superficial (Akcanca & Ozsevgec, 2018). Therefore, this paper is trying to reveal the actual reality of pre-service teachers in Malaysia, whether they are creative or critical in their thinking while they are in teacher training.

Literature Review

The creativity of teachers is essential in nurturing creative and innovative students (Apak et. al., 2021; Doyle, 2019; Saibon et al., 2017). Emphasising focus on students has always been highlighted by educationists, but focus on trainee teachers seems to be lacking despite its importance in encountering all the mishaps in the education world. In some Asian countries, critical thinking ability among pre-service teachers seems to be weak, as some of them cannot even define its level, whether it is strong or weak (Fitriani et al., 2019). Therefore, the unclear measure of creative and critical thinking among pre-service teachers should be investigated, as it is a foundation that may be used to develop an improvement framework to solve this problem. In the World Economic Forum, creative and critical thinking were also highlighted as a necessity in facing Industrial Revolution 4.0 (Kaufman et al., 2018; Sari et al., 2017). This revolution requires creativity and critical thinking to ensure future generations are well equipped to fill up the potential of future emerging job opportunities, which has never existed before (Meagher, 2020). As such, the requirement for creative and critical thinking should be focused on their teacher while in training before they are in charge of developing the future generation.

Over the past 50 years, creativity has been studied and given emphasis, as well as considered one of the most important fields in education (Lucas, 2019). The focus on creativity in learning has also been highlighted, and a few frameworks have been developed to ensure creativity is nurtured among schoolchildren (Chua, 2010; Lucas & Spencer, 2017). At the same time, creativity among teachers is associated with professionalism, which is the ability to deliver quality learning and determine the competence of a teacher (Bereczki et al., 2018; Vaganova et al., 2019). In educational settings such as schools, colleges, and universities, creativity is also associated with geniuses (Chiapello, 2021; Dei, 2022; Paulus, 2021). Geniusness has been

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EISSN: 2637-0905
IJMOE
Volume 5 Issue 19 (December 2023) PP. 280-290
DOI: 10.35631/IJMOE.519020

recognised as a big advantage for students in learning to be creative, but it is possible to instill creativity in lower-performing students as well (McGraw & Stewart, 2020). Therefore, creativity is not only practiced by geniuses, and it is important for all students to learn and master creativity through learning. Since the literature of creativity has evolved in learning, it should not be left behind as a separate part of learning. Thus, the significant relationship among creative teachers in shaping creative students to encounter world challenges and nurturing creative thinking should not be neglected.

Since the age of Plato, critical thinking has been known as a solution to solving problems, making the right decision, and contributing to entangling confusion (Thayer-Bacon, 1998). Critical thinking helps students understand better in learning, helps them grow wiser, and helps them benefit from it (Changwong et al., 2018; Mulyono, 2018). Therefore, fostering critical thinking among higher education students is also highlighted since it is important to help higher education students improve their learning too. Their development to become critical thinkers also needs to be nurtured to empower their critical thinking abilities (Mahdi et al., 2020). Due to how critical thinking plays an important part in learning, it is important to empower pre-service teachers before they face the actual teaching environment, and a lot of approaches were discovered that may be used to heighten critical thinking among higher education students (El Soufi & See, 2019). Several useful learning activities, such as debates, assessments, and many more, could be applied, but the effectiveness of these learning components is yet to be measured by their critical thinking itself.

Problem Statements

A lot of research has been conducted to measure creativity among teachers in service (Gunawan et al., 2019; Patston et al., 2018), but only a small amount of research has been conducted to measure pre-service teachers' creative and critical thinking styles while they are still in training (Arifani et al., 2019; Harris & De Bruin, 2018). Recently, several studies have shown that teachers creativity levels are low, which makes learning dull and uninteresting (Androshchuk et al., 2020; Gaziel et al., 2018; Shkabarina et al., 2020). In Malaysia, teachers have been shown to have a balanced thinking style (Saien et al., 2019), and surprising other research has found that teachers cannot clearly describe what is creative and critical thinking (Yusoff & Selman, 2018).

The problem statement in this paper is that Malaysian pre-service teachers' thinking styles are not being discovered in order to determine what their actual thinking styles are. This is important since the preparation to be a teacher requires creativity and critical thinking (Guillén-Gámez et al., 2023; Ismayilova & Bolander Laksov, 2023; Mills et al., 2023). At the same time, teachers need to equip themselves with creative and critical thinking styles to avoid uninteresting learning that may affect students performance. In this case, pre-service teachers, as a group of higher education students, are the ones who should prepare themselves to face challenges in the educational environment. Even though preparing to be prepared is important, defining the surface of thinking styles among pre-service teachers is more important to be described to encounter this phenomenon.

Methodology

This study uses a quantitative methodology to specify the thinking styles among pre-service teachers in selected institutes of teacher education. The characteristics of the samples in the

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EISSN: 2637-0905
Volume 5 Issue 19 (December 2023) PP. 280-290
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population involved in this study were analysed descriptively. From this identification, a summary to set a representative from the population is made through this analysis.

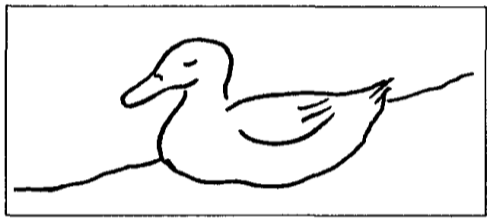
Samples

The respondents involved in this study are pre-service teachers from three different institutes of teacher education. Using a stratified random sampling method, respondents were selected from the entire study population. The characteristics of the respondents consist of different genders, ages, and levels of education that discriminate the characteristics that are formed to obtain the results in determining the thinking style of the study samples.

Instrument

In order to measure the thinking styles of pre-service teachers, a test using self-scoring techniques is used at the tnstitute of teacher education. The self-scoring YCreative-Critical Instrument developed by Chua (2004) was employed in this study. This test consist 34 items in various format. The scoring for each item was made through several measurements. There are structured questions with picture analysis, multiple choices, and open-ended questions. This test requires respondents to answer every question with an alphabetical choice or subjective answer to inidcate repondents thinking style. All answers in this test are scored from one to nine points.

3. Look at the Picture 1, then close your eyes for 5 seconds, and recall what you have seen.



Picture 1

Describe what you have seen.

A A duck and a line.
B A duck on the water.
C A white duck is swimming on the running river.
D Natural life in the green pond.

Figure 1. The Example of YCreative and Critical Test Items

Source: (Creative and Critical Thinking Styles, (p.5), Chua, 2004, Universiti Putra Malaysia Press).

All of these points are summed up and divided by the circle made when answering the test. Then, the final score is read using the thinking style indicator to determine their thinking style. The scoring indicator determines the thinking style using the scales of superior creative thinking style, creative thinking style, balanced thinking style, critical thinking style, and superior creative thinking style. When the final score is obtained, respondents are able to determine what their actual thinking style is based on the test. In this paper, five types of

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thinking styles were involved. Table 1 shows the score that determined thinking styles among pre-service teachers who participated in this study.

Table 1: The Indicators of YCreative and Criticals

Points Score	Thinking Styles
1.00 -1.99	Superior Creative Thinking Styles
2.00 - 4.49	Creative Thinking Styles
4.50 - 5.49	Balanced Thinking Styles
5.50 - 7.99	Critical Thinking Styles
8.00 - 8.99	Superior Critical Thinking Styles

Results

All samples in the population are listed and were extracted from the major population in the research (N = 2344) using stratified random sampling. In the institute of teacher education, a total of 117 respondents were chosen to take part in this study from the population (N = 831) (35.3%) of total samples (N = 331) involved in this study. Secondly, the number of respondents from the Institute of Teacher Education B is 109 (32.9%) of the total population (N = 768). Lastly, the samples from the Institute of Teacher Education C are 105 (31.7%) of the population (N = 745)

Table 2: Samples Involved in The Study

Institution	Population	Proportional Stratified Random Sampling	Percent
ITE A	831	117	35.3
ITE B	768	109	32.9
ITE C	745	105	31.7
Total	2344	331	100.0

The respondents that took part in this research consist of 93 males (28.1%) and 238 females (71.9%). The majority of the respondents are 18 to 21 years old, for a total of 274 (82.8%) from the total sample. The second-largest range of the samples is 22 to 25 years old, with a total of 57 (17.2%). The education level among respondents is mostly from Program Persediaan Ijazah Sarjana Muda Pendidikan (PPISMP), which comprises 189 (57.1%) respondents from the preparatory programme out of the total respondents. This PPISMP programme is the beginning of teacher training before pre-service teachers continue to the actual training programme. The rest of the respondents are in the Program Ijazah Sarjana Muda Pendidikan (PISMP), which comprises 142 (42.9%) pre-service teachers who have already passed the preparatory programme and started training for about four years.

Table 3: Respondents' Profile

Respondent Profile	Frequency (*f*)	Percentage
Gender		
Male	93	28.1
Female	238	71.9
Age		
18 to 21 years old	274	82.8

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IJMOE
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22 to 25 years old	57	17.2
Education Level		
PPISMP	189	57.1
PISMP	142	42.9

The descriptive statistics obtained show the character of the pre-service teachers' thinking style in this study. Measuring creative and critical thinking styles among pre-service teachers unfortunately shows that there is no superior creative thinking style among the pre-service teachers sampled. The study has discovered that 46 respondents (13.9%) among pre-service teachers from the total samples in this study (N = 331) possess a creative thinking style, and another 124 respondents (37.5%) in this study have a balanced thinking style. The majority of respondents in this study have a critical thinking style, with a total of 161 respondents (48.6%). It is shown that most of the pre-service teachers in this study possess a critical thinking style, and none of them have a superior creative or critical thinking style.

Table 4: Thinking Styles of Pre-service Teachers

Thinking Styles	Frequency (*f*)	Percentage (%)
Creative Thinking Style	46	13.9
Balance Thinking Style	124	37.5
Critical Thinking Style	161	48.6
Total	331	100.0

This study also reviews creative and critical thinking styles according to gender. According to gender group, male pre-service teachers recorded a number of 12 (3.6%) respondents, which is over half lower than female pre-service teachers, who recorded 34 (10.3%) respondents. Among these respondents, there are 34 (10.3%) males who were identified as having a balanced thinking style, and another 90 (27.2%) females' pre-service teacher possesses a balanced thinking style. Male respondents who possess a critical thinking style are 47 (14.2%) in total, while female respondents recorded 114 (34.4%). Therefore, the majority of males in this study have a critical thinking style, and similarly, female respondents possess the same style of thinking.

Table 5: Thinking Styles Based on Gender

Thinking Styles	Gender			
	Male	Percentage(%)	Female	Percentage(%)
Creative Thinking Style	12	3.6	34	10.3
Balance Thinking Style	34	10.3	90	27.2
Critical Thinking Style	47	14.2	114	34.4
Total	93	28.1	238	71.9

The age group of respondents is divided into two categories, which are 18 to 21 years old and 22 to 25 years old. The number of respondents who possess creative thinking styles in the range of 18 to 25 years old is 37 (11.2%), and another 9 (2.7%) respondents are in the range of 22 to 25 years old. The other respondents who possess balanced thinking styles among those in the range of 18 to 21 years old are 104 (31.4%), and another 20 (6%) respondents are between the ages of 22 and 25. From the data analysis, respondents with critical thinking styles who are in the range of 18 to 21 years old are 133 (40.2%), while the other respondents in the range of 22 to 25 years old are 28 (8.5%).

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Table 6. Thinking Style Based on Age Group

Thinking Styles	Age			
	18 to 21 years old	Percentage(%)	22 to 25 years old	Percentage (%)
Creative Thinking Style	37	11.2	9	2.7
Balance Thinking Style	104	31.4	20	6
Critical Thinking Style	133	40.2	28	8.5
Total	274	82.8	57	17.2

The following table discusses the education level of pre-service teachers who possess creative, balanced, and critical thinking styles. The respondents in PPIMSP who have a creative thinking style are 23 (6.9%), while the same number of 23 (6.9%) was also recorded among PISMP students. The respondents who have a balanced thinking style among PPISMP are 75 (22.7%), and the other 49 (14.8%) respondents were recorded to have a balanced thinking style among PISMP students. Results indicated that respondents among PPISMP who possess critical thinking styles are 91 (27.5%), and the other 70 (21.1%) PISMP students also possess critical thinking styles. The next section discusses the discoveries of thinking styles according to gender, age classification, and education level.

Table 7. Thinking Style Based on Education Level

Thinking Styles	Education			
	PPISMP	Percentage(%)	PISMP	Percentage(%)
Creative Thinking Style	23	6.9	23	6.9
Balance Thinking Style	75	22.7	49	14.8
Critical Thinking Style	91	27.5	70	21.2
Total	189	57.1	142	42.9

Discussion

The truth discovered in this study is that none of the students in the institutes of teacher education possessed superior creative thinking or superior critical thinking styles. This study also discovers that most of the respondents identify themselves as possessing a critical thinking style, but only a handful of them possess a creative thinking style. The number of female pre-service teachers, which is the highest in this study, makes a huge contribution to defining thinking styles among pre-service teachers.

As seen from the data obtained, female pre-service teachers have shown a larger number than males who possess a critical thinking style rather than those who have a creative thinking style. This is also in line with previous studies that stated females are more critical thinkers (Çelik et al., 2018; Dinçer & Çilek, 2022; Fitriani et al., 2019). In the sense of age, the highest number of pre-service teachers are at the age of 18 to 21 years old, and most of the respondents acquired critical thinking styles from this age group (Zhan, 2021) rather than the age range of 22 to 25 years old.

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EISSN: 2637-0905
IJMOE
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At the same time, results show that the highest number of pre-service teachers who acquired critical thinking styles were at the beginning of their study compared to the senior teacher students. Interestingly, the smallest number of pre-service teachers who possessed creative thinking styles is the same among pre-service teachers at both education levels. From the descriptive data, gender, and age classification obtained, the creative thinking style grows to balance the thinking style upward to a more critical thinking style. However, there is a significant gap in every thinking style possessed by pre-service teachers.

In the category of education level, there is a small difference in the number of pre-service teachers who possess these three thinking styles. This shows that there is a possibility that education level plays an important role in determining whether pre-service teachers have creative, balanced, or critical thinking styles (Ayçiçek, 2021; Demirhan & Köklükaya, 2014). This research implies that the development of creative thinking styles should be given more emphasis in educational environments since the number of pre-service teachers who possess creative thinking skills in higher educational institutions is relatively low. Based on this discovery, the study suggests the education system in the institute of teacher education should focus more on the development of creative thinking in order to encourage more creative teachers rather than shaping their thinking styles to be more critical. This study also suggests steps should be taken to ensure that pre-service teachers' thinking is balanced with creative and critical thinking. In future studies, more pre-service teachers from across the country will be needed to assess their creative and critical thinking abilities before they complete their studies and begin their careers at the educational institution.

Conclusion

As teachers, being creative is important in order to preserve their commitment, ensure their teaching career is full of passion and motivation, and make certain that their lessons are always effective. It is clear from this study that the number of pre-service teachers in the urban area was prone to having critical thinking rather than creative and balanced thinking styles. In conclusion, this study shows that the majority of pre-service teachers who are still in training possess more critical thinking than creative thinking. This dynamic review should consider that gender and age classification play an important role in determining thinking style, but education also plays an important role in attempting to educate pre-service teachers into becoming teachers with balanced thinking styles.

From an academic standpoint, the number of critical thinkers among pre-service teachers is high compared to balanced and creative thinkers. The study hopes that the possibility of the education system killing creative thinkers among pre-service teachers is demonstrably untrue. This is not a good sign in the effort towards producing teachers who are creative or balanced in their creative and critical thinking. Therefore, this study suggests that future studies should be planned to measure the creative and critical thinking of pre-service teachers gradually from the start of training until they finish to explore more on the shaping of future teachers equipped with creative and critical thinkers. Perhaps something should be planned by the institutes of teacher education to develop more creative teachers in the future that will nurture a more creative generation that can not only think critically but also creatively and bring colour into the education world.

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IJMOE
EISSN: 2637-0905
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DOI: 10.35631/IJMOE.519020

Acknowledgement

The author wishes to express his profound gratitude to the Faculty of Education at the University of Malaya, the honourable professor as supervisor, friends of the same study, colleagues at institutes of teacher education, and all those who assisted the authors in the publication of this article.

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Volume 5 Issue 19 (December 2023) PP. 280-290
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