

# TURNITINPRESERVICEEFLTEACHERSCREATIVETHINKING

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## PRE-SERVICE EFL TEACHERS' CREATIVE THINKING

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**Abstract:** This study aims to investigate the pre-service teachers' creative thinking at the faculty of Teacher Training and Education, *Universitas Kristen Indonesia*. It is limited to the difference of creative thinking between the male and female students. It was conducted at the Christian University of Indonesia within a period of 3 months from February to May 2021. The research design used was ex-post facto. The research subjects are 36 semester students who were selected purposively. The research instrument used is a standardized essay test. The data taken through test were analyzed using descriptively, besides using a descriptive quantitative, the data of the research were also analyzed using independent t test through SPSS. The results of this study shows that the faculty of teacher training and education students' creative thinking skills at the level of "good" category, which is 63.69%. From a further analysis, it is found that the comparison between male and female students' creative thinking skills did not have a significant difference. Thus, it can be concluded that male students' creative thinking ability are much the same with the female students' creative thinking ability at the Faculty of Teacher Training and Education, *Universitas Kristen Indonesia*.

**Keywords:** creative thinking; teaching English; male and female.

### INTRODUCTION

In learning biology, higher-level thinking skills (HOTS) are required. The implementation of learning is carried out through a scientific approach so that students' HOTS can develop well. The scientific approach is a learning approach characterized by the protrusion of the dimensions of observation, reasoning, discovery, validation, and explanation of a truth so that the learning process must be carried out guided by scientific values, principles, or criteria. But in reality, the learning implementation process still emphasizes the mastery of knowledge, without paying attention to process skills and HOTS development. This happens because in general the teacher's perception of the learning process is only as a transfer of knowledge which is more dominated by memorizing theories, concepts, principles, phenomena or formulas. An important ability to be developed by students in the 21st century HOTS. It is the ability to make use the new information and the ability to manipulate it in order to reach possible answers in new situations (Tyas & Naibaho, 2021; Conklin, 2011; Irvine *et al.*, 2010).

HOTS that a student must have, namely the ability to think innovatively and creatively (critical thinking and problem solving and metacognitive thinking) (Clemente *et al.*, 2016; Singh *et al.*, 2018; Tang, 2016). Creative thinking ability is one of the important thinking skills to be developed in the field of education. Creative thinking is "a cognitive ability to generate and develop new ideas, new ideas as a development of ideas that have been born previously

and the ability to solve problems divergently" (Barbot *et al.*, 2011; Leggett, 2017).

Creative thinking ability is an important aspect for students to be able to solve a problem and find new ideas to solve problems (Ülger, 2016; Berestova *et al.*, 2021), generate new ideas by combining, changing or adding existing ideas, using various ideas, improving, analyzing and evaluating ideas in order to improve and maximize creative problem solving efforts (Naibaho, 2022; 2022).

There are four aspect of the creative thinking, namely fluency, flexibility, authenticity, and elaboration in thinking (Turkmen & Sertkahya, 2015; Batlolona *et al.*, 2019). Fluency, is the ability to trigger many ideas, methods, suggestions, questions, ideas, solutions, or alternative answers smoothly in a certain time quickly and with emphasis on quality. "Flexibility is the ability to issue various ideas, answers or questions where the ideas or answers are obtained from different points of view by changing the way of approach or thinking. Originality (authenticity), which is the ability to issue expressions, ideas, or ideas to solve problems or create unusual, unique, new combinations of parts or elements that others have not thought of. Elaboration (details), is the ability to enrich, develop, add, elaborate, or detail the details of the object, idea, or situation so that it becomes more interesting" (Serevina *et al.*, 2018).

"Creative thinking skills are part of the learning process to help students become successful learners, confident individuals and become responsible citizens so it is important to develop them in various subjects

to help students to be able to develop their creativity and be creative in solving problems” (Li, 2016; Fisher, 2018; Eragamreddy, 2013). The development of creative thinking skills in students is not only useful for the present life, but also as a provision of knowledge to prepare for the life to come. The goal is that students are able to anticipate and respond to future challenges or times that are always developing and undergoing changes, thereby encouraging students' creativity and innovative skills in solving problems and facing challenges and competition in the future (Azevedo *et al.*, 2019; Adamczyk *et al.*, 2012).

The ability to think creatively is also needed to find new innovations in human life. The growing needs and complexity of the problems faced by this country, demands creative thinking for the community. “New innovations are expected to be born from the results of creative thinking as an effort to improve the quality of life and solve problems faced by the community” (Stroh, 2015; Proctor, 2010). The ability to think creatively makes students have many ways to solve various problems with different perceptions and concepts. Creative thinking skills give birth to innovative students, so students can provide a new innovation from the results of problem solving (Drapeau, 2014; Kivunja, 2014; Binkley *et al.*, 2012). If people's creative thinking skills are low, it will have an impact on their lives in the future. A person with low creative thinking skills, will not be able to compete in an increasingly advanced life and lose good job opportunities. The problems he faces are also unable to be solved effectively and he is unable to face the challenges of an increasingly complex life. In fact, compared to 20 or 30 years ago, Indonesian graduates now need more skills to succeed in facing the tough competition of the 21st century. English is one of the subjects that has an orientation to equip students to face the challenges of life in the 21st century. Several studies have shown that Pre-Service EFL Teachers are less able to think creatively (Çakici, 2018; Karataş & Tuncer, 2020). Learning creative thinking skills really needs to be integrated in every subject, including English.

Several previous studies also examined the effect of gender or gender on creative thinking skills reported that there was no significant difference between male and female gender creative thinking skills (Bart *et al.*, 2015; He & Wong, 2021; He, 2018), gender had no effect on students' creative thinking skills (Hong & Milgram, 2010; Mierdel & Bogner, 2019), and there was no significant difference between high achievers and low achievers in terms of creative thinking, but good female students who excel high and low are proven to be more creative than male students so that the effect of

gender differences (Ellis *et al.*, 2016; Stoet *et al.*, 2016). Women have creativity and innovation as creative styles in the thinking process significantly higher than men at the higher education level (Ülger & Morsünbül, 2016; Da Costa *et al.*, 2015; Madsen, 2015), and the ability of male students was superior to that of female students. “Male students are more open in their thinking, so that with their thoroughness, male students are able to think abstractly mathematically to bring up novelty and flexibility by finding different patterns of answers and generalizing the results they find” (Senel & Bağçeci, 2019; Tous & Haghighi, 2016). While female students in their thinking are still on concrete experiments, and the difficulty of making abstract observations of abstract numbers so that patterns are generally not found (Robertson, 2013; Kouhdasht *et al.*, 2013). However, female subjects were more fluent in expressing their written answers.

This study aims to determine the profile of the creative thinking abilities of male and female students and the differences in creative thinking abilities between male and female students at Faculty of Teacher Training and Education, Universitas Kristen Indonesia.

#### **METHOD**

This research is an ex post facto research or non-experimental research because it aims to examine what the research subjects have naturally without any intentional effort to provide treatment in order to bring up the variables to be studied. The study population was all students of Faculty of Teacher Training and Education, Universitas Kristen Indonesia. The sampling technique used was cluster sampling technique, which took the students in a classroom to be the sample of the study. The number of students chosen from Faculty of Teacher Training and Education, Universitas Kristen Indonesia was 36 students. The instrument used is an essay test. The essay test was taken from a standardized essay test from the writing book used by the English lecturer in teaching. So it was not necessary to measure the validity and the reliability of the test. The procedure for collecting data is by asking each student to work on an essay question for 10 minutes. The work on essay questions may be brought home with the condition that the time limit for the work is the same, but this method has the risk of causing bias that makes the research results different. The data obtained were then analyzed using quantitative descriptive analysis and independent t-test, data calculations using SPSS vers. 21 with a significance level of 0.05. The normality test and homogeneity test were

carried out before the independent test. Normality test using the Kolmogorov-Smirnov test with the help of SPSS vers. 21, while the homogeneity test used Levene's test with the help of SPSS vers. 2. After the data were analyzed, then the result of the analysis was converted to the following creative thinking score range in order to know the level of students' creative thinking.

Table 1. *The creative thinking ability score range*

Score Range	%	Information
Score 0- 19		Very Poor
Score 20- 39		Poor
Score 40- 59		Moderate
Score 60- 79		Good
Score 80-100		Very Good

## RESULTS AND DISCUSSION

The students' creative thinking ability test uses an essay test consisting of 4 questions, each question represents an indicator of creative thinking ability, namely fluency, flexibility, originality and elaboration with each, each with a maximum score of 4. The creative thinking ability test was given to 36 students with details of 18 male students and 18 female students. The results of creative thinking ability test for each indicator can be seen in the following table.

Table 2. *Calculation of indicators of students' creative thinking*

Creative Thinking Ability Indicator	Total value	Average	%	Category
I01	136	3.83	80.21%	C
I02	85	2.25	48.22%	LC
I03	130	3.02	78.12%	C
I04	85	2.25	48.22%	LC
Average Creative Thinking Ability			63.69%	Good

Note: I01 (fluency), I02 (flexibility), I03 (originality), I04 (elaboration), C (creative), and LC (less creative)

Based on table 2, the results show that I01 is 80.21%, I02 is 48.22%, I03 is 78.12% and I04 is 48.22%. The percentage between 60-79% is included in good category, so that the creative thinking ability of students at Faculty of Teacher Training and Education, Universitas Kristen Indonesia is in the "good" category. Faculty of Teacher Training and Education has implemented a new curriculum, namely the Higher Education Curriculum based KKNI. The Higher Education Curriculum based KKNI is a competency-based curriculum that is directed at achieving the competencies formulated in the graduate competency standards. The Higher Education Curriculum based KKNI uses a scientific approach concept.

The scientific approach is one of the approaches used in learning with an emphasis on the use of scientific methods in teaching and learning activities (Özgelen, 2012). Emphasis on the use of the scientific method is based on the essence of learning which is actually a scientific process carried out by students and teachers. "The scientific approach makes students think scientifically, logically, critically and objectively according to the facts" (Brookfield, 2022; Lai, 2011).

The scientific approach used in the learning process is able to empower students' creativity through a more active teacher role in provoking students' creativity and providing more opportunities to improve creative, innovative, and critical thinking skills (Bloom & Doss, 2021; Zhao *et al.*, 2021; Harris & de Bruin, 2018). The scientific approach was developed with a scientific approach which includes five processes, namely observing, asking, exploring, associating and communicating (Sale & Thielke, 2018; Cohen, 2018; Haig, 2018). The scientific approach is often referred to as the 5M approach.

At the observing stage, the teacher gives students the opportunity to make observations, so that students connect their initial knowledge with the phenomena they face. Observation activities foster student curiosity. Students' curiosity is manifested in the form of a question, so that students are trained to find and integrate known problems into a new, original question. "Observing and questioning activities show that students' creative thinking skills are trained, especially original thinking skills" (Tran *et al.*, 2017; Lucas & Spencer, 2017). The ability to think creatively can be recognized by posing problems. The process of observing makes it easier for students to ask many questions or ideas. The ability of students to pose problems of opinions and ideas through questions can optimize one aspect of students' creative thinking skills, namely fluency (Phuong & Nguyen, 2019; Zhang *et al.*, 2021). The stages of observing and asking questions in a scientific approach train original thinking skills and fluency thinking skills. The exploration stage or collecting information is the stage where students conduct experiments, conduct literature studies, observe events or conduct interviews with resource persons to solve problems (Dziedziewicz *et al.*, 2013; Chang *et al.*, 2015). The exploration stage is accompanied by the associating stage, namely the stage of processing the information obtained so that students can draw a conclusion. The exploration and association stages train students' reasoning skills, namely the ability to think logically and systematically.

The exploration and association stages are the

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problem-solving stages. The problem-solving stage is a stage that trains many aspects of creative thinking skills. Aspects of fluency in the problem solving process are trained through the ability of students to give correct and varied problem answers. The flexibility aspect in problem solving is trained through the problem solving process using different methods, such as conducting various kinds of experiments to get the expected results. "Aspects of originality in problem solving are trained through the ability of students to answer problems with answers that are not usually presented by students at their level of knowledge" (Bell & Waters, 2018). The ability to solve problems with new answers occurs because students carry out the process of gathering information and conducting their own experiments for proof, thus bringing up original problem-solving answers.

The exploration and problem-solving stages also train the elaboration aspect of creative thinking skills. Problem solving activities such as conducting experiments, making students design an experimental process which includes the design title, objectives, tools and materials, and working methods. A series of processes in conducting experiments by carrying out systematic and detailed steps to train students' elaboration skills. The communicating stage is the stage of delivering information that has been obtained and has been processed both orally and in writing. The communicating stage develops honesty, thoroughness, tolerance, language skills and the ability to think systematically (Fakhretdinova *et al.*, 2020; Rivers, 2018). The stages of communicating do not run in one direction only, but a question and answer process occurs between the presenter and the audience. The questions given by the audience will be discussed by the presenter, so that the answers to the questions are found. The process of solving problems through discussion certainly produces many ideas and answers from various points of view. "The ability of students to provide many ideas and answers from different points of view shows the trained ability of students to think fluently and flexible" (Lin & Wu, 2016; Chang *et al.*, 2015). The discussion process trains students' fluent and flexible thinking skills.

Scientific learning has trained aspects of students' creative thinking skills. The stages of observing and asking questions practice fluency and original thinking. The stages of exploring and associating practice fluent thinking, flexible thinking, original thinking, and elaboration thinking. The stage of communicating trains fluent

thinking and elaboration thinking (flexibility). The results obtained show fluency and originality have a high percentage of 77.08% and 72.91%, respectively. The percentages that exist are included in the creative category, while elaboration thinking and flexible thinking have a percentage of 35.42% and 35.92%, respectively. The percentage is included in the sufficient category. Differences in aspects of creative thinking can be caused by differences in implementation at each stage in the scientific approach. The aspect in the creative category shows that the implementation of the stages has been maximized, while in the moderate category it shows that the stages have been implemented but are not maximal.

The fluency of students in Faculty of Education and Teacher Training is included in the creative category. The creative category is supported by maximum fluency training at all stages of scientific learning. The application of the maximum stages means that the learning process provides opportunities for students to ask various questions, answer questions, so as to successfully encourage students to generate many ideas about a problem and smoothly express their ideas (Florea & Hurjui, 2015; Hill & Miller, 2013). The flexible thinking ability of students in Faculty of Education and Teacher Training is included in the sufficient category. The sufficient category produced can be caused because the stages in the scientific approach have been carried out but have not been carried out optimally. The original thinking ability of students in Faculty of Education and Teacher Training is included in the creative category. The creative category is supported by maximum originality aspect training at the observing and questioning stage as well as exploring and associating in scientific learning.

The ability of students' elaboration thinking at Faculty of Teacher Training and Education is included in the sufficient category. The percentages shown are in different categories with original aspects and fluent thinking which are in the creative category. The differences that occur can be caused by the implementation of the scientific approach stage that has been carried out but has not been maximized. The stages that provoke the elaboration aspect in the scientific approach are the stages of digging information where students are trained to conduct experiments and read references which are carried out sequentially. The systematic work carried out by students provides opportunities for students to explore sequentially and in depth, so that at this stage they can practice the elaboration aspect of creative thinking. The level of creativity of students in Faculty of Teacher Training and Education, *Universitas Kristen Indonesia* is included in the category of sufficient

overall aspects. The results obtained indicate that learning has implemented the KKNi Base Higher Education Curriculum. The implementation of all stages of the scientific approach has been carried out and proven by the emergence of students' creative levels, but the implementation is still not optimal in several stages because the overall results of students' creative levels are in the quite creative category.

Table 3. Male students' creative thinking ability indicator calculation

Creative Thinking Ability Indicator	Total value	Average	%	Category
I01	80	3.78	83.61%	C
I02	49	1.83	36.33%	LC
I03	67	3.23	79.44%	C
I04	49	1.83	36.33%	LC

Note: I01 (fluency), I02 (flexibility), I03 (originality), I04 (elaboration), C (creative), and LC (less creative)

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 Table 4. Female students' creative thinking ability indicator calculation

Creative Thinking Ability Indicator	Total value	Average	%	Category
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I01	64	2.31	79.45%	C
I02	35	1.20	35.23%	LC
I03	61	2.01	78.29%	C
I04	35	1.20	36.23%	LC

Note: I01 (fluency), I02 (flexibility), I03 (originality), I04 (elaboration), C (creative), and LC (less creative)

Based on Tables 3 and 4, data analysis was obtained for male and female students at Faculty Teacher and Training Education, that the percentage of I01 in female students was 79.45% < 83.61% in male students, thinking ability I02 for female students is 35.23% < 36.33% for male students, I03 for female students is 78.29% < 79.44% for male students, and I04 for female students is 36.23% < 36.33% for male students. The males' and females' students creative thinking when compared from each indicator shows that the creative thinking ability of male students is higher than female students. The graph of the difference in the creative thinking abilities of male and female students on each indicator is as follows.

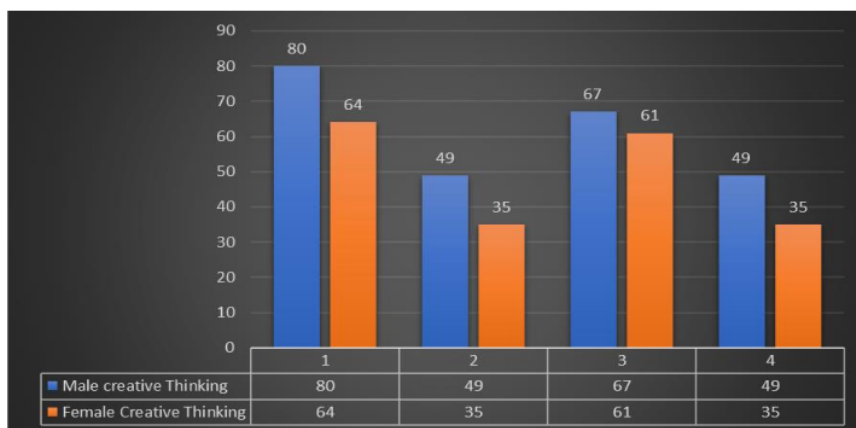


Figure 1. Differences between males' and females' creative thinking

The data obtained from the males' and females' t-test which had previously been tested for students creative thinking were tested using a normality and homogeneity are shown in table 5. independent t-test. The results of the independent

Table 5. T-test calculation using SPSS

t-test for Equality of Means						
t	df	Sig. (2-tailed)	MD	Std. ED	Confidence Interval of the Difference (95%)	
					Lower	Upper
-1,354	34	,185	-5,55556	4,10321	-13,89428	2,78316
-1,354	32,184	,185	-5,55556	4,10321	-13,91165	2,80053

The result of the independent t-test was -1.354 with a significance ( $\alpha$ ) 5% was 2.032244, and the significance value was 0.185 > 0.05. The calculation results show that  $H_0$  failed to be rejected, which means there is no real difference between the creative thinking abilities of male students and female students. It is in line with a research which shows that "gender has no significant effect on students' creative thinking skills in English learning" (Ghonsooly & Showqi, 2022; Özcan, 2010). "On the other hand, the results of the study are not in line with the findings of the study which

stated that the results of the trial concluded that the ability of male students was superior to that of female students (van Dun *et al.*, 2021; Rizvi *et al.*, 2022). Male students are more open in their thinking, male students are able to think abstractly mathematically to bring up novelty and flexibility, while female students are still in thinking in concrete experiments, and have difficulty making abstract observations of abstract numbers.

In essence, there is no effect of gender differences on intellectual abilities such as overall creative thinking ability, but gender differences appear in several cognitive areas, such as mathematical abilities and verbal abilities. Boys have higher visual-spatial skills than girls" (Yang *et al.*, 2019; Secora & Emmorey, 2019). The error factors that affect the results of the creative thinking ability data are: 1) Restrictions on questions number 1 and 3 so that students are motivated by the minimum restrictions presented; 2) students experienced procedural errors in working on test questions, because they misunderstood the order of the questions; 3) the difficulty of students in working on one of the questions tested, because they do not understand the concept.

## CONCLUSION

The results showed that the average percentage of students' creative thinking abilities was 63.69% in the sufficient category. The findings of each indicator are as follows: I01 is 80.21%, I02 is 48.22%, I03 is 78.12% and I04 is 48.22%. The percentage between 60-79% is included in "good" category. The results of the different test of creative thinking skills between male and female students showed that there was no significant difference. The suggestions given to the Faculty of Education and Teacher Training is the importance of increasing creative thinking because creative thinking is needed in 21st century learning. Suggestions for further researchers are: 1) ensuring the number of male and female students in each class, 2) working on questions must be at the right time and place the same one.

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