

# IDENTIFYING TEACHER TRAINEES' CREATIVITY CHARACTERISTICS IN TEACHING STUDENTS WITH LEARNING DIFFICULTIES

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**Abstract:** This study aims to identify UPSI (Universiti Pendidikan Sultan Idris) teacher trainees' creativity characteristics in teaching students' with learning difficulties in school. Creativity is one of the factors that can influence a person's achievement in academic as well as in his career. So, universities should encourage future teachers to be creative and innovative individuals. Hence, the objective of the study is to identify to what extent trainee teachers in UPSI have the creativity characteristics based on Torrance creativity elements that include fluency, originality, flexibility and elaboration in teaching. The sample of the study is seventh semester students undergoing 16 weeks of teaching practicum in selected schools. A total of 24 respondents were selected purposively based on the teacher trainees' placement in selected schools. In order to identify the creativity characteristics, a qualitative case-study was conducted and data was collected using recorded observation, interview and document analysis. For observation, the instrument used was recorded teaching and observation notes; for interview, six semi-structured questions were prepared; and for official documents, a checklist of teaching aids used was used the study. The findings indicate that the number of respondents with creativity characteristics is higher in the aspects of (1) fluency, (2) elaboration, (3) originality and (4) flexibility. For the frequency of creativity characteristics, it was found that respondents have the highest frequency characteristics in (1) fluency, (2) originality, (3) flexibility and (4) elaboration. It is hoped that the findings of the study could give new perspective towards the importance of creativity in teaching and that teachers would increase their knowledge in order to be creative teachers. The implication of the study conducted is important for the nation development because creativity is among the human capital aspect that is important since the future economy depends on citizens with creative and innovative minds.

**Keywords:** characteristic, creativity, learning difficulty, teacher trainee

## Introduction

Creative thinking is an important survival skill for 21st century. We need this skill to help us face challenges in life, adapt and develop ourselves in education, business and life as a whole. (Carson, 2010). An individual who shows high creativity is more marketable and considered having special ability by employer. Creative thinking is related to flexibility and successful adaptation to everyday life is considered an entrepreneurship (Amabile, 1997). Creativity is considered as one of the important aspects of future skills since the future economy depends on creative and innovative citizens. Therefore, many countries such as China, Hong Kong, Taiwan,

Japan, Singapore and not forgetting Malaysia, have provided specific programmes in their education systems to increase creativity among students. Educationists are seen to intensify their teaching focus to creativity and innovation especially in the teaching of Science which is considered as the best medium to realize the effort (Kelly & Littman, 2000; Sternberg et al., 2005). This area was not given attention causing inability in students to apply knowledge and think critically outside academic context.

The insistence towards creativity is an issue in universal discussion in this world since creativity influence economic activities globally (Craft, 2003). School or higher institution of learning is the place to instill creativity for the future generation. Torrance (1979) stated that if a country wants to change its education system to a creative one, the teachers have to be creative first. Creativity is a factor that drives the development of a country. Gustina and Sweet (2014) study proved that there are six reasons why creativity is important. Firstly, economy value, government's priority, education, reference, productivity, and administration. Therefore, human capital development for a country is through providing its students with knowledge and creativity in various fields of education. (Lin, 2011; Shaheen, 2010).

Teachers play vital role in encouraging students' creative thinking through suitable approaches in the classroom (Kleiman, 2008; Livingston, 2010; Young, 2009). Several researchers in creativity had summarized three main aspects about creativity in the classrooms. They are creative teaching (Gibson, 2010), teaching creativity (Jeffrey & Craft, 2004), and creative learning (Lucas, 2001). According to Craft (2006), teaching creatively means using imaginative approaches to make learning interesting and effective. Teachers must not only know creative teaching approaches but also create creative learning environment. For example, preparing a learning activity that requires exploration because this activity generate lots of creativity when getting information, communicating, and produce ideas to solve problems. In school, teachers need to use creativity to achieve learning objective and also to attract students' attention to learn not only in the process aspect, but also verbal, visual, auditory and kinesthetic resources and products. In fact Johansson (2004) also suggested that students should be encouraged to collaborate with other students in their learning activities so that they can be more creative. Creativity influence teaching especially for Special Education students with multiple disabilities. To be a creative teacher, creativity must be inculcated. This is explained by Sternberg (2006) that educational programme should not only focus at enhancing creativity but also focusing at students' existing potential creativity. As trainee teachers, the training duration is the best time for the them to develop creativity, apply the characteristics of creativity that they possess, produce creative products, and create creative teaching and learning environment. Apart from having the opportunity to use teaching skills, teacher trainees can sharpen their creative abilities that they may not have the opportunity to show. As teacher trainees in Special Education, they should have creativity in teaching especially in implementing teaching activity and using teaching resources. A creative teacher will transform past ideas for improvisation and produce a more attractive new product (Starko, 2014). if a lecturer wants to encourage creativity and to show creativity intelligence among students, the creative thinking aspect should be included in assignments and tests (Sternberg, 2006). Study by Scott et. al. (2004) has proven that divergent thinking, problem solving, and creative attitude are most effective creative exercise. According to Scott, LeritzdanMumfords (2004), creativity can be trained. Creativity training programme can be conducted based on idea generating exercise, imaginative exercise, cognitive exercise and thinking skills exercise. Nevertheless, it is quite difficult to evaluate

individual's creativity based on creative assignments and creative products because creativity is subjective.

How does a creative person look like? What makes a product creative? According to Starko (2014), creativity is seen in a creative individual and products that show creative characteristics. In this case, firstly, creativity involves new product (idea, arts products, innovation and others). To be creative, the idea and product must be something new. Secondly, creativity should include suitability of resource or idea that can be referred to in the cultural context. The concept of creativity differs among culture (Kaufman & Sternberg, 2006; Lubart, 2010). It involves individual, spiritual values or a Nation's development. Therefore, teachers need to see students' background when producing creativity taking into account various social aspects and cultural value. It is possible that a teacher's creative idea is not suitable with the individual's ability and learning style. A creative person has metaphorical thinking, problem solving skill, able to self-evaluate and self-assess, logical thinking, and high rate of visualization (Starko, 2014; Ward & Kolomyts, 2010). They can generate ideas, make inference, relate, predict, make hypothesis and analogy, and synthesize. For problem solving, the creative process involves activities such as recognizing problem, interpret problem, application of existing knowledge to handle problems until problems are solved. So creativity is a mental activity to produce new, extra-ordinary and unique ideas (Beghetto & Kaufman, 2010). Some creative abilities can be learned by building new knowledge based on old ideas (Runko, 2007). Some of the techniques used to encourage creativity is idea generation and divergent thinking (Sternberg, 2006). Divergent thinking comprises fluency (ability to generate many ideas), flexibility (ability to generate many types of ideas or ideas from many different perspectives) and elaboration (ability to add information to improve ideas) (Ward & Kolomyts, 2010).

## **Literature Review**

### **Models And Theories On Creativity**

Studies on creativity can be conducted based on several creativity models (Guilford, 1988; Lubart, 2001; Scott, Leritz, & Mumford, 2004). Basically, creativity models can be used to explain creativity process that aim to identify and measure components to produce creativity.

#### ***Torrance Framework for Creative Thinking (TFCT)***

Torrance Framework for Creative Thinking (TFCT) (Torrance, 1979) is one of the creativity tests based on fluency, flexibility, originality and elaboration (Kim, 2006; Torrance, 1979, Wright, 2010). With reference to the test, researchers in creativity field have divided the creativity characteristics into several components such as original ideas, frequency of relevant ideas (fluency), categorical ideas (flexibility), elaboration of ideas (elaboration) and others (Scott et al., 2004; Torrance, 1999). In fact, most researchers evaluate creative process based on fluency, flexibility, originality, and elaboration (Kuan Chen Tsai, 2014, Plucker & Renzulli, 1999; Sternberg & O'Hara, 1999; Vincent, Decker, & Mumford, 2002). A cognitive style of divergent (Guilford, 1950) or associational thinking (Mednick, 1962) is sometimes called originality (Eysenck, 1993). Guilford's approach to this cognitive style got much attention after he included it as an own operation dimension (divergent production) in his famous Structure of Intelligence (SOI) model and operationalized it in the form of divergent (production) tests (Guilford, 1967a). These divergent tests, of whom besides Guilford's (1967a), those of Torrance (1974) and Wallach & Kogan (1965) are well-known examples, deviate from standard 'convergent' cognitive abilities

tests in demanding not one right answer, but as many different responses as possible, like various uses for an object or titles for a short story. The responses are subsequently scored on objective scales measuring assumingly different dimensions of creative ability, traditionally fluency (number of responses), flexibility (number of different categories covered by the responses), originality (statistical infrequency of the responses) and elaboration (amount of details given).

### ***Humanistic Theory***

Creativity is always being referred to the humanistic theory. The humanistic theory pushes what we need to be encouraged to advance creatively, regardless of the challenges. It is not the suppression of creativity that makes us creative but the encouragement that makes us creative. The major tenet of humanistic theory is that humans have six basic needs. These needs need to be met before we can thrive. Once these needs are met we can reach self-actualization and are now free and comfortable enough to express ourselves in a creative manner. This theory argues that environment is not a factor in creativity because if the person is able to meet the six basic needs they can then tend to be creative. Creativity is central to our growth and learning processes and as such help us to advance ourselves within society. Believers of this theory believe self-actualization allows us to live a meaningful life and break out of social and cultural control becoming an individual rather than just another face in the crowd. It is argued that our main motivation for creativity is to compensate for a perceived physical or intellectual disability.

### ***Convergent and Divergent Thinking***

Convergent and Divergent thinking is a theory about the way some people view a problem and come up with a solution. Ideas of convergent and divergent thinking are supported by Sternberg (2006). Convergent thinkers tend to concentrate their thoughts down the path of a single solution. Divergent thinkers on the other hand bring forth multiple solutions to each project. At the beginning of the creative process, divergent thinking generally occurs. We could generate many different possible solutions to the problem through brainstorming, creating art works, free writing, or mind mapping. Once we have generated enough different solutions to the problem we then go into convergent thinking mode. At this stage we use our convergent thinking to examine what we know about the problem and begin to whittle down the solutions we have come up with to generate a single solution that is best for the problem at hand. We look at each solution we come with previously and look at the things we know about the problem and how each solution we come with impacts on these facts. Do they fit? If not the solution is put aside and we will examine the next solution. By using both forms of thinking together we come up with as many solutions as possible to the problem at hand then narrow it back down to the solution we will use for our project. These two forms of thinking should be used together at the same time, rather in different stages of development. For example if convergent thinking was used during a brainstorming session new ideas would be squashed because they do not allow for this aspect or that aspect before they even get a chance to fully develop. Rather divergent thinking should use first to create many ideas and to further develop each of these ideas. Then convergent thinking should be used to narrow the solutions down to one or just a few for further development.

### ***Cognitive Approach***

The Cognitive approach to creativity takes place in two main phases. The first phase is a generating phase during which we come up with ideas or pre-inventive structures we feel may help obtain solutions to a problem. This is then followed by the exploratory phase during which we use the ideas, thoughts and pre-inventive structures we came up with in the first phase to come up with ideas to solve that problem. We explore ways we can use these thoughts to create a solution to the original problem. Simple brainstorming for example, will begin with a brainstorming session to generate ideas as well as restrictions and other considerations. Afterward we then move onto exploring ways to implement these ideas till we settle on a suitable solution to the original problem. The relationship of individual differences in creativity to individual differences in cognitive abilities, such as intelligence, is still discussed. Indeed, any possible relationship between creativity and intelligence has been proposed (Sternberg & O'Hara, 1999). In one extreme version, creativity and intelligence are regarded as totally independent, a position especially taken by some cognitive psychologists with strong focus on the creative process (Weisberg, 1992, 1999). These authors see creativity as a mental operation accessible to everyone, only dependent on domain-specific knowledge (i.e. the amount of exposure to and expertise in a given field) and deliberate practice. Their position therefore denies not only the influence of intelligence, but of any individual difference beyond knowledge and motivational factors, on creativity. According to Starko (2014), creativity influenced by cognitive, affective, motivational and social environment aspects. The most important aspect of creativity is cognitive and affective. The creativity element in cognitive aspect involves general or specific knowledge, perception, originality, complex view such as analysis, integration and using different idea or concept, open mindedness, and creativity awareness (Beghetto & Kaufman, 2010).

### ***Implicit/Explicit Interaction Theory***

Creativity is also related with Implicit/Explicit Interaction Theory which involved Implicit/Explicit Knowledge. Implicit knowledge is know how. It is the things we know how to do, our personal skill set. Implicit knowledge on the other hand is knowledge we can only really gain from personal experience, from actually doing. Explicit Knowledge is data or information that we know to be true. Explicit knowledge is generally thought of as information we are able to learn from some sort of information database. It is the information we gain from reading books, from general research on the web or from simply talking to someone with knowledge on the subject. This theory posits that our creativity is heavily affected by these two elements. As we try to create something we search for data (explicit knowledge) on the subject matter. This is usually the basis of what we present but could also help formulate the ideas on how we create it. Once we know more about what we want to create we start to look at how we could go about creating it. What skills and abilities do we have that could help us to present our explicit knowledge? How can we use our implicit knowledge to represent our explicit knowledge? Although explicit knowledge often helps to steer us in the direction we chose for our final designs it usually forms the basis of the content for our project. It is more the implicit knowledge or our skills and ability that form the way we present the content. However without both we would not achieve a finished product because we would either have nothing to present or no way to present it. Explicit knowledge that could help us to achieve our creative goals could include looking at other examples of how data relating to that subject is usually presented. What is the industry standard for presentation of this type of data? From there we can then look at our own implicit knowledge for ways we could improve on this standard.

### ***Research On Creativity***

The first-ever meta-analysis in the field of creativity research was conducted by Feist (1998) and dealt with the personality of creative people. More precisely, Feist analyzed the results from 26 studies comparing scientists vs. non-scientists (total N = 4852), 28 studies comparing more creative vs. less creative scientists (total N = 3918) and 29 studies comparing artists vs. non-artists (total N = 4397) according to personality traits that predicted creative achievement. Feist concluded that creative people are more autonomous, introverted, open to new experiences, norm-doubting, self-confident, self-accepting, driven, ambitious, dominant, hostile, and impulsive. Out of these, the largest effect sizes are on openness, conscientiousness, self-acceptance, hostility, and impulsivity. Yet, creative people in art and science do not completely share the same unique personality profiles: Artists are distinguished more by their emotional instability, coldness, and their rejecting group norms than are scientists. Most reviews of creativity and personality, like Feist (1998) focus on creative achievement. It surely is convincing to see eminence or recognized creative products as the purest criteria of creativity. But creative achievement in a field, let alone eminence or genius, is without doubt synergistically determined by more than just a disposition towards creativity (Eysenck, 1993, Feist, 1998; Sternberg & Lubart, 1991). Beside multiple external factors facilitating or inhibiting a creative career (from education, socioeconomic status and home environment to cultural, religious and historical), some internal factors may be mere catalysts for bringing a creative product to public recognition.

Westby and Dawson (1995) found that creative students are impulsive, emotional, and opportunists. Whereas, less creative students are very dependable, appreciative and good natured. Creativity can be influenced by activities carried out. Gardner (2007) stated that five activities that require a creative individual to do are problem solving, produce concept or theory, create product, achievement style, and show great and unique achievement. A creative individual is good at solving spontaneous or existing problems. He or she can think to produce relevant ideas to overcome a problem. Problem solving involves intelligence in the thinking process to make a decision. An individual's creativity can be evaluated based on the ability to produce new concepts or theories based on situations. For product creation, a unique and original idea is produced from the creative thinking process that involves old ideas for improvisation and making new attractive (Starko, 2014). According to Wright (2010), the creative process involves seven steps that is, findings and problem solving, flexibility, fluency, elaboration, transformation, objectivity and selectivity and aesthetic appreciation. Findings and problem solving is related to finding and exploring information, and alternative approaches to a problem. For example, conducting an experiment on multiple colours to get a new colour. The flexibility process refers to taking different approaches towards a problem, thinking for ideas in various ways or looking at a problem from a different perspective, such as, changing a colour background for a picture with a situation from daylight to night. The fluency process is producing ideas for open questions or problems, for example a story on a poster picture. The elaboration process involves an increase of detail ideas by developing, elaborating and improvising ideas, such as verbal explanation on life in the sea.

### **Problem Statement**

How does a person look creative? What makes a thing look creative? According to Starko (2014), creativity is seen in an individual context and materials with creative characteristics. In this case, firstly, creativity involves new products (ideas, arts products, innovation, creation and others). To be creative, an idea and product must be new. Secondly, creativity must be suitable with appropriate resources or ideas that can be referred to in the cultural context. The concept of creativity differs according to culture (Kaufman & Sternberg, 2006; Lubart, 2010). This

involves individual, spiritual values or development of a country. Therefore, teachers need to see students' background when producing creativity by taking into account various social and cultural values. It is possible that a teacher's creative idea is not suitable with students' ability and learning styles. A creative individual has metaphorical thinking, skill in problem solving, ability to self-evaluate and self-assess, has logical thinking, and high rate of visualization (Starko, 2014; Ward & Kolomyts, 2010). They can generate ideas, make inferences, relate, predict, make hypothesis, create analogy and synthesize. Preparation to be a teacher involves a lot of process. Apart from receiving knowledge theoretically, one has to attend practical training as a trainee in school. In order to enhance the teaching profession, trainees should equip themselves with knowledge and teaching skills before they are offered to be qualified and quality teachers. In teaching students with special needs, creativity needs to be given attention by trainee teachers because teaching students with special needs differs from teaching the normal students. Nevertheless, does the learning process in the university be to produce creative and innovative teachers? To what extent trainee teachers undergoing teacher training in the university has creative skills to teach students in school?

### **Research Objective**

This study aims to identify trainee teachers' creativity characteristics in teaching Special Education students during teaching practicum in schools. Based on this, four objectives have been designed. The objectives are to identify teacher trainees' creativity for:

- i. fluency in teaching
- ii. originality in teaching
- iii. flexibility in teaching
- iv. elaboration in teaching

### **Research Question**

To identify teacher trainees' creative ability in teaching Special Education students during teaching practicum, four research questions have been designed. They are:

- i. Do the Subjects have creativity in fluency aspect?
- ii. Do the Subjects have creativity in originality aspect?
- iii. Do the Subjects have creativity in Flexibility aspect?
- iv. Do the Subjects have creativity in the elaboration aspects?

### **I. Methodology**

This study was conducted for a duration of 12 months. This qualitative case study uses observation, interview and document analysis for data collection. For observation, the instrument used was video recording, and observation notes, interview questions, and analyzing teaching aids used during teaching. Observation is done when the teacher trainee. Data collection for observation and interview involves the Subjects only. Data is collected during teaching and learning session comprising set induction teaching steps and conclusion. Every activity conducted is observed information is jotted down based on the creativity characteristics comprising four creativity elements that is, fluency, originality, flexibility and

elaboration. The sample is Semester 7 students undergoing teaching practicum for a period of 16 weeks in selected schools. A total of 24 Subjects were selected using purposive sampling based on the trainee teachers' allocation in schools with Special Education Integration Programme. The Subject selected in this study were from eight schools. The subjects taught by the trainee teachers were *Bahasa Melayu* (Malay language), Mathematics, Living Skills (Cookery, Sewing, Agriculture), Arts Education, Islamic Education, and Science. From the total 24 samples, the Subjects teaching *Bahasa Melayuis* 20.83%, Mathematics16.67%, Science 8.33%, Arts Education 8.33%, Living Skill Sewing 12.50%, Living Skills Cookery 16.67%, Living Skills Agriculture 8.33%, and Islamic Education 8.33%.

## II. Research Findings

This study adapts Torrance Framework for Creative Thinking creativity characteristics that contains Fluency, originality, flexibility and elaboration characteristic (Kim, 2006; Torrance, 1979). Creativity cannot be seen with the naked eye but can be evaluated by observing an individual. This is explained byStarko (2014) that creativity is seen in creative individual and materials that have creative characteristics. In this context, firstly, creativity involves new product (idea, arts product, innovation and others). To be creative, the idea and product must be new and can be tested (Sternberg, 1999). Clearly, creativity is related to the ability to produce new product or idea (Lubart, 2010; Sternberg &Lubart, 1991). Based on observation, interview and official document analysis, the finding shows that the Subjects show different characteristics of creativity and the findings is reported based on three research questions.

### 1) Do Subjects have creativity in fluency aspect?

Creativity characteristics in fluency refer to the competency in producing idea to solve problems, increase understanding and remember information. Data is collected by observation and video recording.The research findings show that three Subjects can produce ideas to solve problem in teaching spontaneously, 17 Subjects have creativity characteristics in fluency able to produce ideas to increase students' understanding and 19 Subjects had successfully produce ideas to remember information.Overall score found that the Subject frequency in producing idea to solve problems was 3 times, frequency to produce ideas to increase understanding was 19 times and frequency to produce ideas to remember ideas was 44 times.

**Table1.1**  
**Creativity Characteristics inFluency**

Nos.	Fluency characteristics	Observation (%)	Interview (%)
1	Problem solving	7.69	4.55
2	Remember information	43.59	28.79
3	Understand information	48.72	66.67
	Total	100	100

The finding shows that 7.69% Subjects are creative in solving students' problem, 43.59% can produce creative ideas to assist students to remember previous lessons and 48.72% had successfully produce ideas to understand information delivered.Whereas for frequency, the interview data shows that 4.55% Subjects use creativity to solve problems, Subjects frequency to

use creativity in producing ideas to assist students understand the subject content is 28.79% and Subject frequency using creativity to assist students to remember information and subject content learned is 66.67%.

2) Do Subjects have creativity in originality aspect?

The second creativity characteristic is originality. It refers to unique and outstanding original ideas. The information is synthesized in a new form. The finding shows that eight Subjects were able to generate unique ideas and four Subjects were able to generate original ideas. Frequency score shows that ability to generate unique ideas is 22 times and ability to produce original idea is 5 times.

**Table1.2 Creativity Characteristic in Originality**

Nos.	Fluency Characteristic	Observation (%)	Interview (%)
1	Unique idea	66.67	81.48
2	Original idea	33.33	18.52
	Total	100	100

For originality characteristic, observation and analyzing video recording shows that 66.67% Subjects could generate unique idea and 33.33% could generate original ideas. For original frequency characteristic, data analysis for interview shows that Subject frequency in generating unique ideas in teaching is 81.48% and Subject frequency to produce original ideas is 18.52%.

3) Do Subjects have creativity in flexibility aspect?

The third creativity is flexibility that relates to production of various ideas in thinking that involves the ability to innovate creativity from multiple aspects. It was found that seven Subjects shows that the flexibility characteristic in this study is 8 times for teaching strategy, 2 times for different views and once for flexibility in innovating ideas.

**Table1.3 Creativity Characteristic in Flexibility**

Nos.	Fluency characteristic	Observation (%)	Interview (%)
1	Different strategy	66.67	72.73
2	Different view	22.22	18.18
3	Innovation	11.11	9.09
	Total	100	100

For flexibility characteristic, the Subjects had creativity in producing various ideas in thinking that involves the ability to innovate creativity from various views, approaches and strategies. Data analysis shows that 66.67% Subjects are creative in using different strategies in teaching, 22.22% Subjects are creative in using different approaches, and 11.11% are creative in innovating teaching techniques. For flexibility characteristics, the Subject frequency in using different strategies in teaching is 72.73%, the Subject frequency to generate different view is 18.18% and frequency in innovating teaching is 9.09%.

4) Do Subjects have creativity in the elaboration aspects?

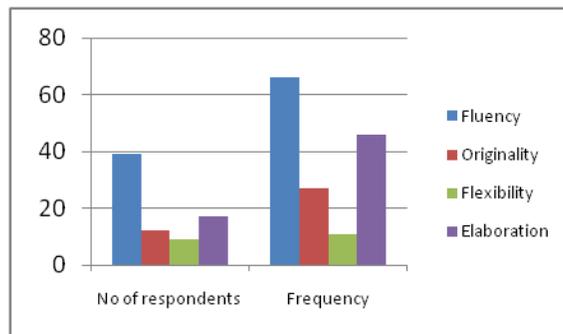
The fourth creativity characteristic is elaboration. It refers to the process of idea development through detail elaboration that will increase interest and understanding in learning a topic. This is related to the ability to develop ideas and make them more interesting. The finding shows that 17 Subjects have creativity that can develop ideas through detail explanation to enhance students' interest and understanding. Overall, the Subject frequency score found that 46 times elaboration characteristic have been produced successfully .

**Table1.4 Creativity Characteristic in Elaboration**

Nos.	Frequency characteristic	Observation (%)	Interview (%)
1	Detail explanation to arouse interest	41.18	43.48
2	Detail explanation for understanding	58.82	56.52
	Total	100	100

Observation finding shows that Subject creativity in elaboration involves development of ideas in activity through detail explanation that can increase interest and understanding in learning a topic. It was found that 41.18% use creativity to give detail explanation to attract students' interest and 58.82% used creativity to give detail explanation for students to understand subject content. For frequency of elaboration 43.48% Subjects give detail explanation to attract students' interest and 56.52% Subjects give detail explanation to enable students to understand teaching.

Overall, the findings show that the number of creative Subjects is higher in fluency (50.65%), second, is elaboration (22.08%), third is originality (15.58%) and fourth is flexibility (11.69%). For frequency of Creativity characteristic, it was found that 44.00% Subjects have frequency in fluency in teaching, 18.00% have 7.33% frequency in originality and 30.67% have frequency in elaboration. Figure 1 shows the comparison of creativity characteristic in fluency, originality, flexibility and elaboration.



**Fig 1 Comparison of Subjects Creativity Characteristic**

### III. Discussion

The study has proven that most UPSI's teacher trainees have fluency in producing ideas to solve problems, increase understanding and remember information learned. The finding is supported by study conducted by Westby dan Dawson (1995) that state a creative individual has *metaphorical thinking*, has skills in problem solving, self-evaluate and self-assess, logical thinking, and has high visualization rate. A creative individual always strive to solve various problems or able to produce something new and useful in specific areas from time to time (Ainon, 2008). Fluency is the ability to think about various ideas spontaneously. Fluency ia also seen from the context of delivering systematic information with language that is easily understood. To deliver ideas fluently one needs creativity. In fact Gardner (1993) stated that a creative individual will, from time to time, tries to solve problems, or strive to produce something new and useful in specific areas. Fluency in delivering ideas prove a person's creativity and this can be identified based on several characteristics such as fluency in comparing, changing, counting, giving definition, explaining, labelling, identifying, listing, matching, naming, designing, paraphrasing, predicting and summarizing. Torrance and Ball (1984) and Torrance, (1990) has proven that the more ideas given by an individual, the higher his or her competency and fluency. Anidea is the result of creative thinking that is important to assist an individual to make decision, solve problem and generating abstract and concrete ideas (Yee et al., 2011). In fact, Sternberg (1999) stated that learning based on problem solving is one of the activities that can stimulate creativity. In problem solving activity, information and ideas are collected, arranged and analyzed to get the solution for the problem.

The second creativity characteristic that is most prominent among trainee teachers are elaboration. This finding is supported by Ward and Kolomyts (2010) that by mastering elaboration characteristic a person is able to add information and improve ideas. Elaboration is a process of developing ideas by detail explanation that can increase interest and understanding in learning a certain topic. This is related to ability in developing ideas and adding ideas to be more interesting. In this study, the elaboration elements comprise assessment, critics, setting, evaluation, grading, judgment, measurement, selection and test. Apart from the potential to stimulate active learning, creativity is also able to assist students to elaborate concepts or ideas and attract students, and thus produce meaningful learning (Elliot et al., 2000).

For originality characteristics, the finding shows that only one third of the Subjects demonstrate creativity in producing original, unique or outstanding ideas. This involves thinking ability that can produce new, unique and interesting ideas. This is confirm by Starko (2014) that an individual who always give original ideas normally able to give creative ideas. Creativity in teaching means teacher using imaginative approaches to make learning more interesting, effective, fun and liked by students. This is related to ability to create and produce or in new form through imagination skill (Craf, 2006; Gustina & Sweet, 2014). However, new finding shows that teacher trainees lack unique and original ideas to generate new ideas. Whereas creativity is a thinking process that helps to assist a person in producing new ideas (Green, 2001). Teacher trainees also lack ability in synthesizing. Synthesizing skills combine ideas, elements, items and separate matters to produce a comprehensive picture in the form of statements, essay, arts and artifacts. This finding is supported by Westby and Dawson (1995) study that proved creativity can be seen in ability to synthesize ideas. A creative individual can synthesize many ideas spontaneously. This skill is used when a person wants to find new ideas or alternatives. In fact Ainon and Abdullah (1999) stated that by having in depth knowledge in a certain field, a person can produce original and useful. Knowledge and useful ideas encourage

creativity in producing types of ideas that is outside the norms of a particular field. Creativity is a mental activity to produce new, outstanding and unique ideas (Beghetto & Kaufman, 2010).

Characteristic of creativity that is the least mastered by trainee teachers is flexibility. This characteristic is related to the ability to produce multiple ideas in thinking. It involves the ability to adapt creativity by looking at things from various perspectives and different strategies and approaches. According to Jeffrey and Craft (2004), teaching creatively means using imaginative approaches to make learning more interesting and effective. In the flexibility context, a creative individual can change ideas, instruct, differentiate, use, interject, translate and predict. Creativity is a mental activity to produce new, unique and outstanding ideas (Beghetto & Kaufman, 2010). The production of new and unique ideas is related to cognitive and non-cognitive skills. This shows flexibility is able to produce a certain idea or different answer and look at problems creatively as a new assignment. A creative individual has flexibility characteristic that can face whatever changes and challenges. However, if an individual lacks creativity, flexibility does not exist in that person. Therefore to get in-depth knowledge, a person needs to mingle with people with different knowledge (Johansson, 2004). By this way, they can generate ideas, different views and thinking that can generate creativity. The study by Kuan Chen Tsai (2014) has proven that fluency, flexibility and originality is more accurate in evaluating creativity achievement. Ideas that have the tendency to be similar can be combined and integrated in new presentation in order to understand a matter more clearly.

#### **IV. Conclusion**

Basic creative characteristic is they to produce ideas, new methodology and problem solving. There are several basic characteristics of a creative individual. Among others is having the ability to think and play with ideas, concepts, symbols, words and numbers where creativity functions to see outstanding relationship between those matters. Therefore, a creative individual will think of various perspectives that have the possibility to solve problems. A creative individual has the ability to think from different perspectives. They also have the in-born ability to change existing methodology or approaches. Usually a creative individual can generate outstanding or unique ideas. A creative individual prefers challenges than smoothness and prone to complex task than moderate. Creativity also encourages individuals to have interests in multiple areas and enjoy life from various perspectives.

The characteristics needed for creativity are ready to be independent in thinking, does not give easily give up, able to communicate well, more interested in concept, inclination to learn various knowledge, humorous, accept new ideas and clear objective in life (Sternberg, 1999). Many creative individuals have side characteristics that make them difficult to mix around with other people and have disorder life. Therefore, a creative individual will look strange, not bothered about other people, proud and less sociable. To stimulate creativity, a teacher must encourage students to think laterally and associate different ideas. Lateral thinking means solving problems by using imaginative ideas (not using logic or normal thinking) until various superb and effective approaches are achieved. Lateral thinking is one way of solving problems by using imaginative ideas and not by logical or traditional thinking (Edward de Bono, 1992). It is a thinking that emphasizes multiple answers and can be used to get away from old ideas that have been practiced before. They must be able to translate and use learning in new context, look at things from various perspectives and test with different approaches in problem solving.

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